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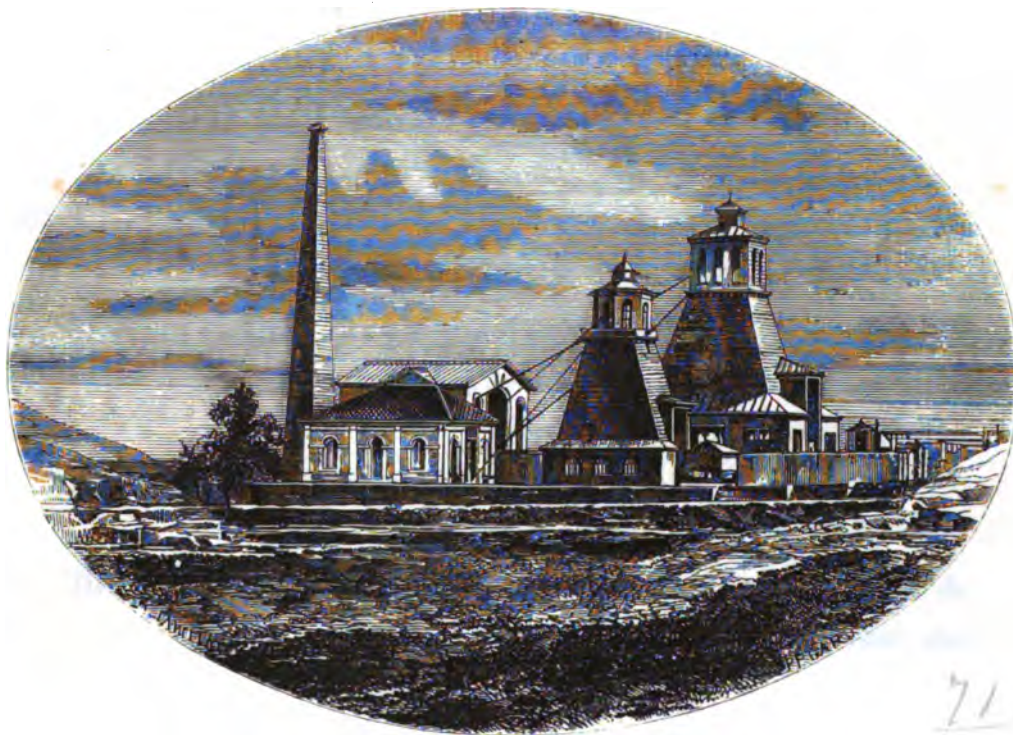
COURS
D'EXPLOITATION DES MINES

PAR

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ATLAS



PARIS

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COURS

D'EXPLOITATION DES MINES

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NOTA. Les planches de l'atlas du *Cours d'exploitation*, au nombre de 88, font suite à celles des deux atlas du *Matériel des houillères*. C'est un total de 205 planches réunissant tous les documents qui intéressent l'industrie minière.

Fig. 2. Coupe verticale suivant MN .
indiquant la division en étages.

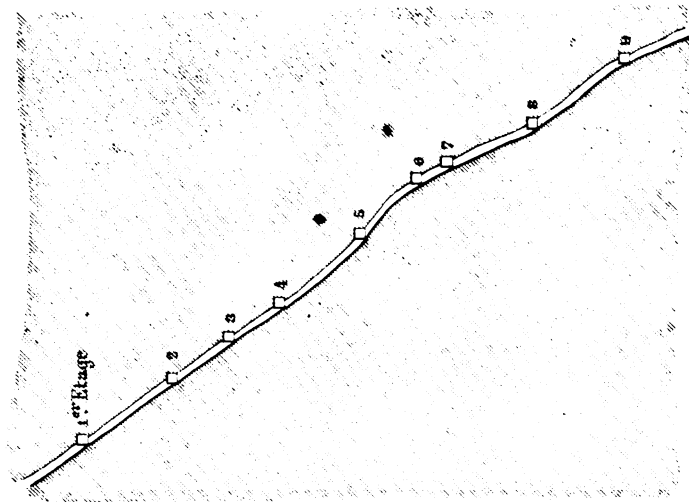
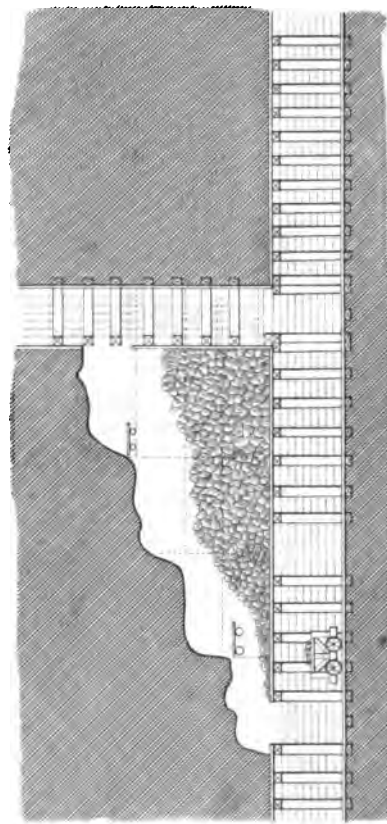


Fig. 4. Chantier par gradins renversés.



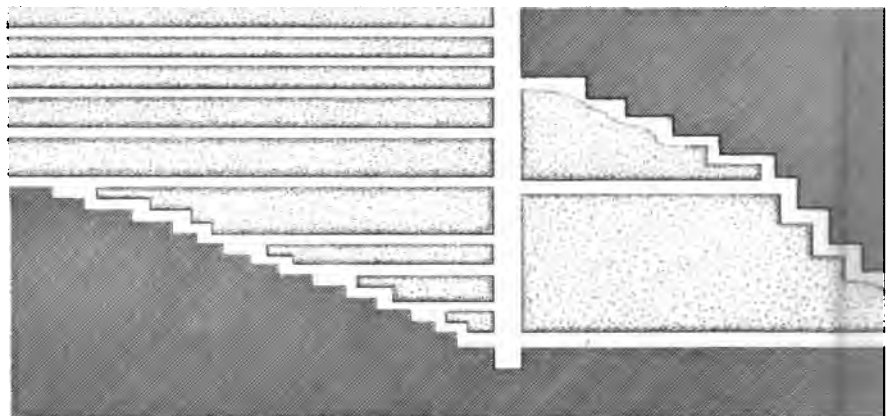
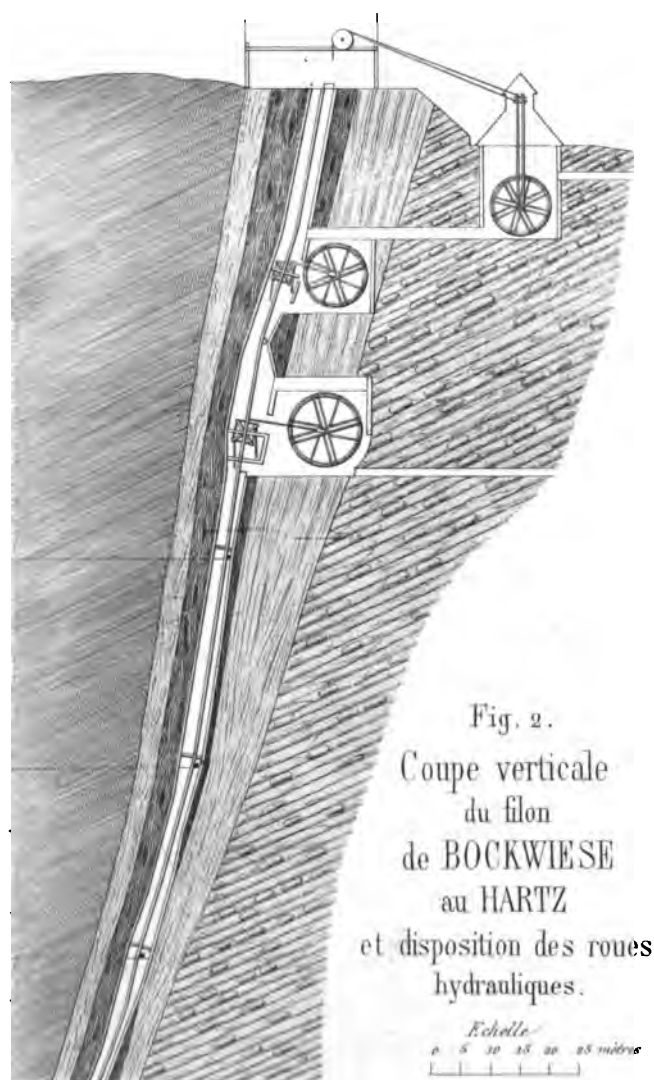
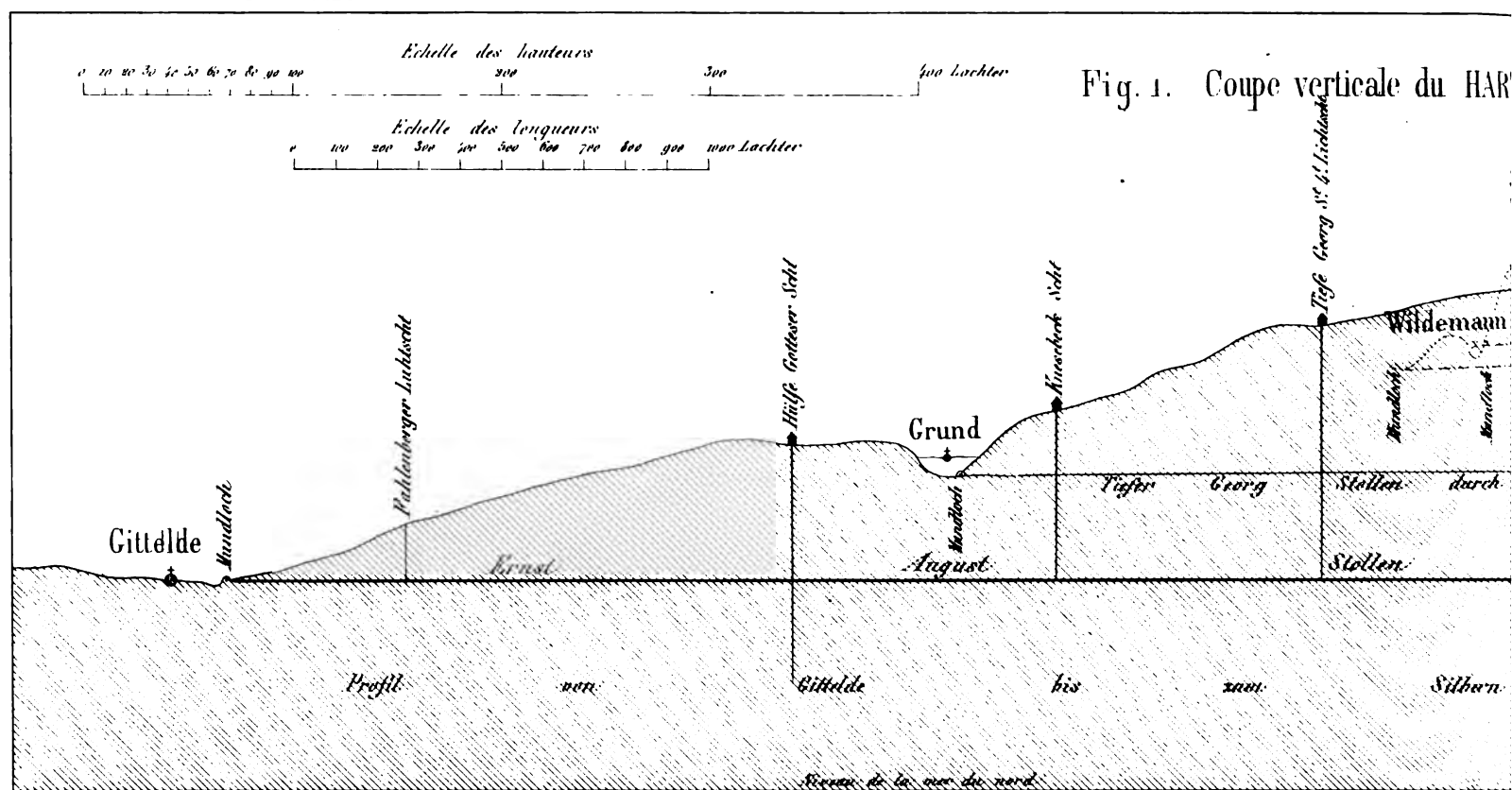


Fig. 3. Exploitation par gradins droits et par gradins ren-

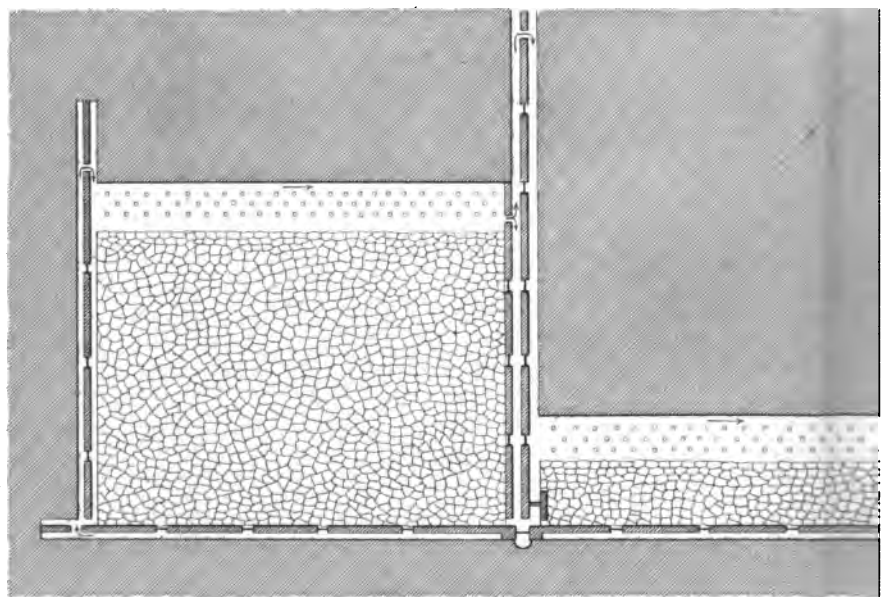
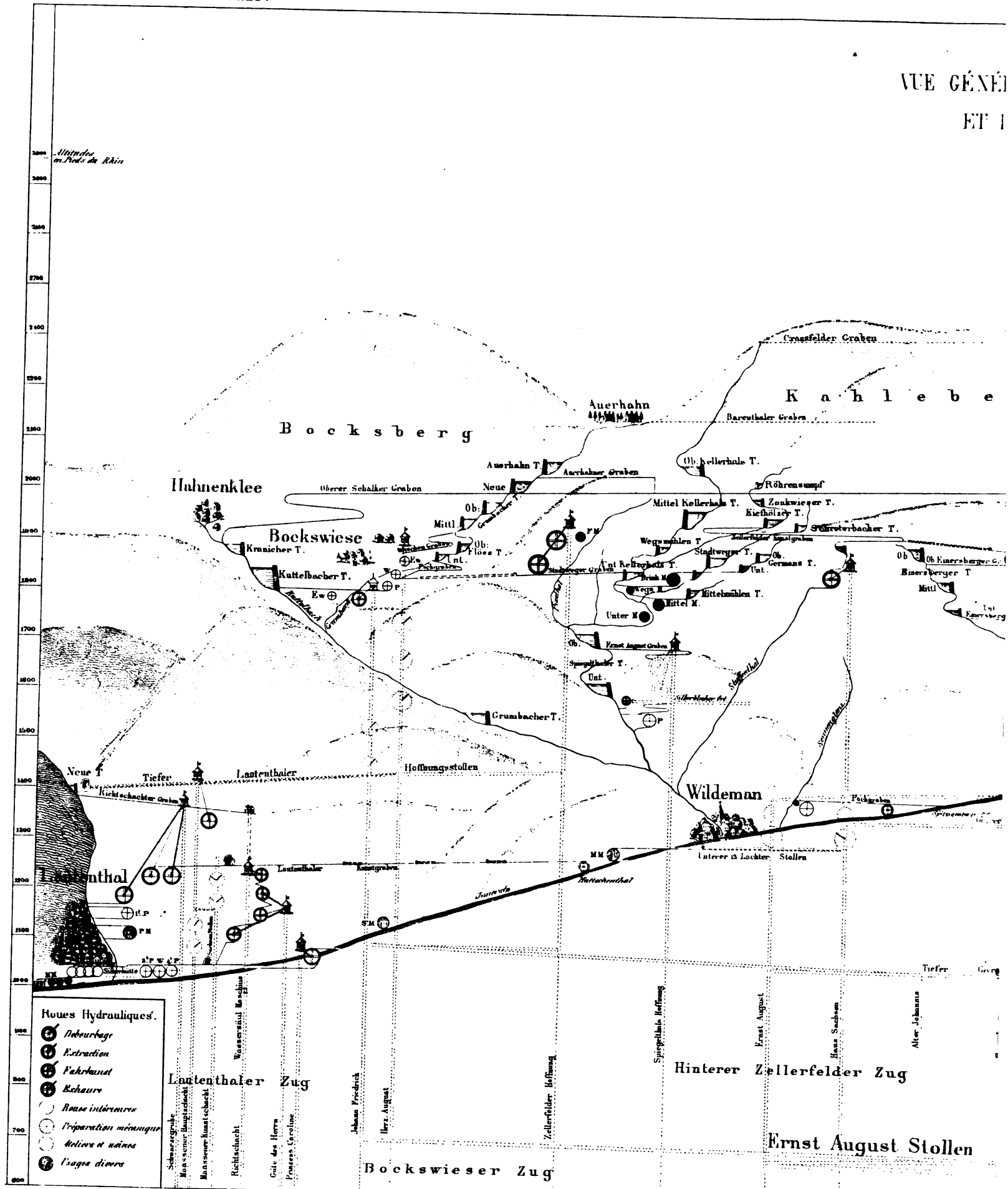


Fig. 4. Plan d'une exploitation par grandes tailles



E DES TRAVAUX SOUTERRAINS, DE L'AMÉNAGEMENT
SERVICE HYDRAULIQUE DE L'OBÉR HARTZ. (NORD-OUES



COUPE DU HARTZ.

DES TRAVAUX SOUTERRAINS, DE L'AMÉNAGEMENT
SERVICE HYDRAULIQUE DE L'OBERSHARTZ. (NORD-OUES

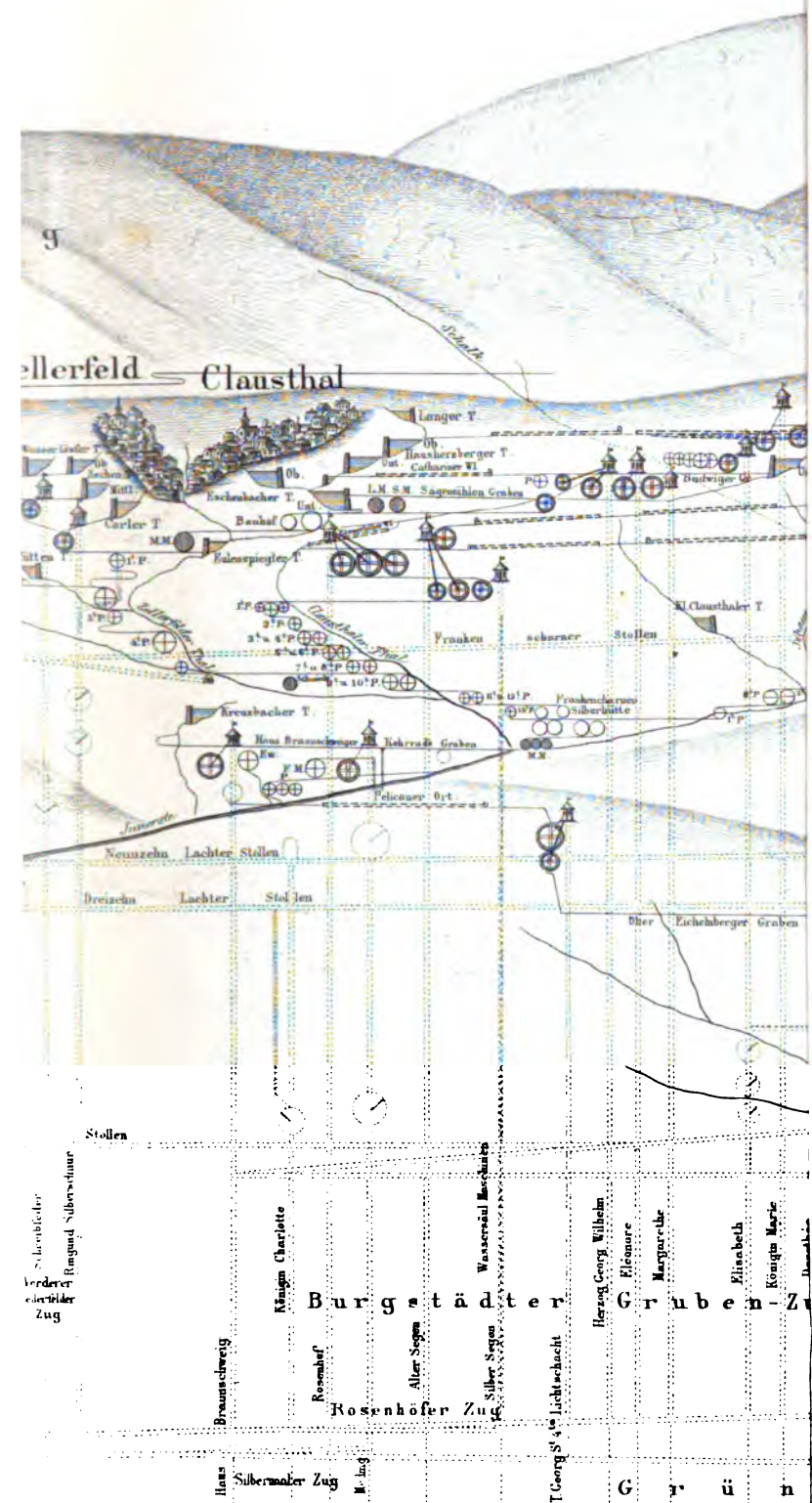


Fig. 1. Coupe d'un puits à Anzin.

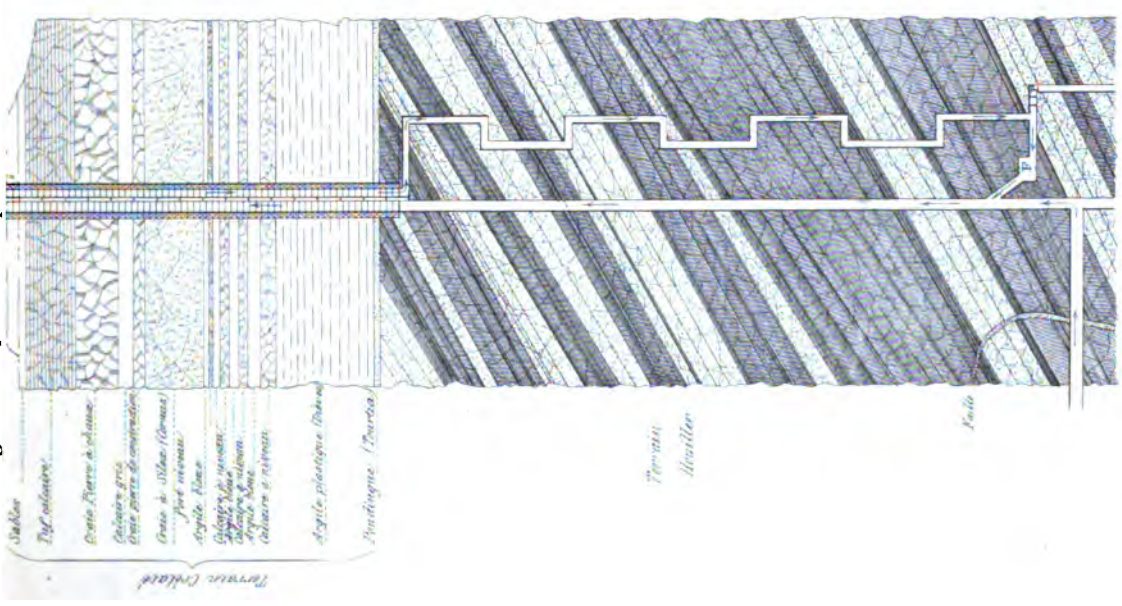


Fig. 2. Plan d'une exploitation par trauages et compartiments.

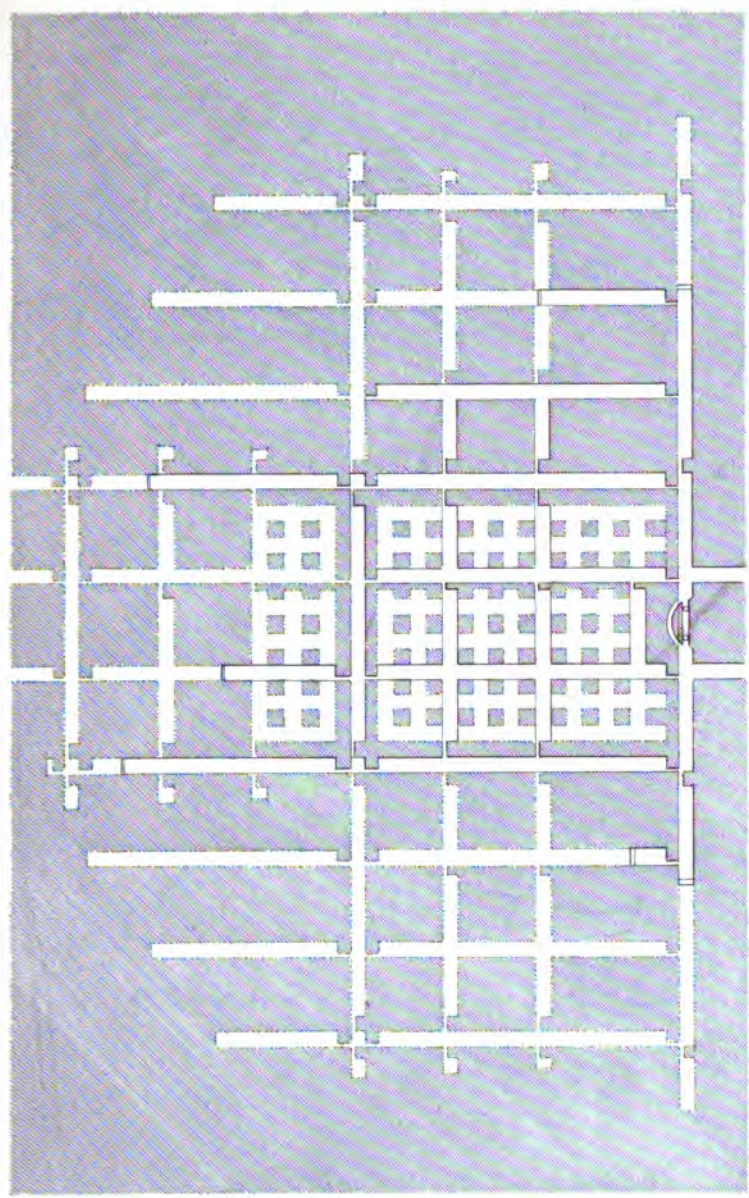
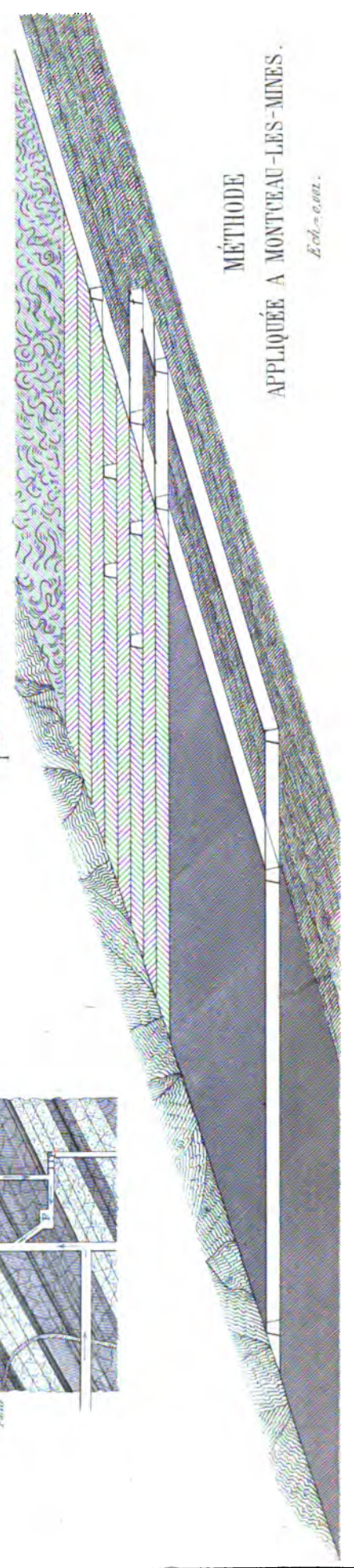


Fig. 3. Coupe d'une exploitation par tranches horizontales et remblais.



MÉTHODE
APPLIQUÉE A MONTCAU-LES-MINES.
Ech. = 0.001.

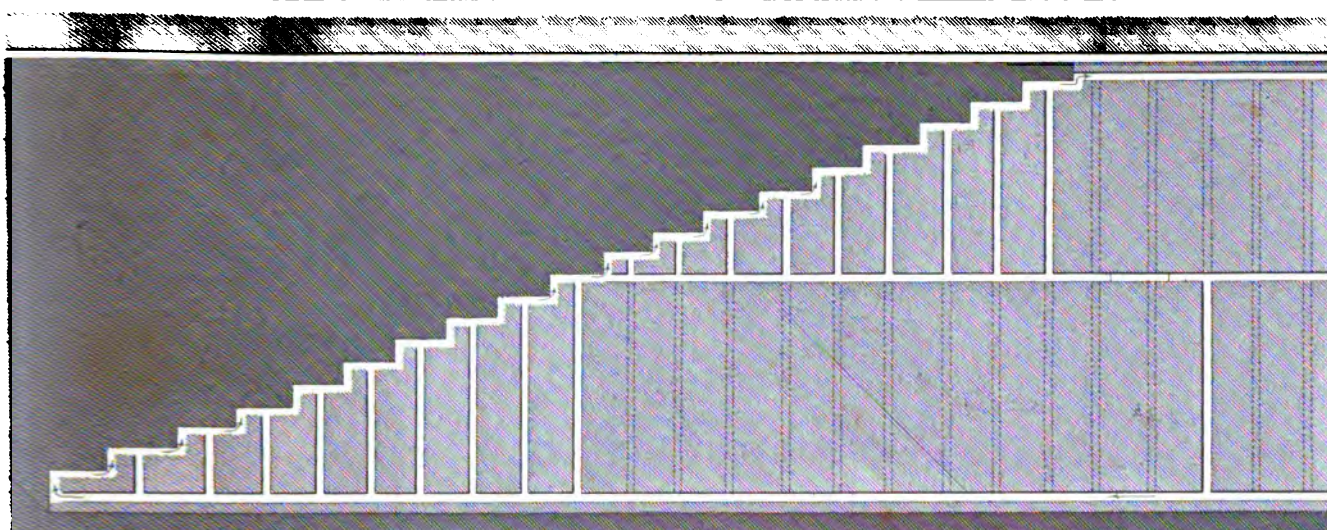


Fig. 1.
Couches inclinées
de 0 à 15°

MÉTHODE
MONTMOISE
par
gradins montants
et voies tiernes.

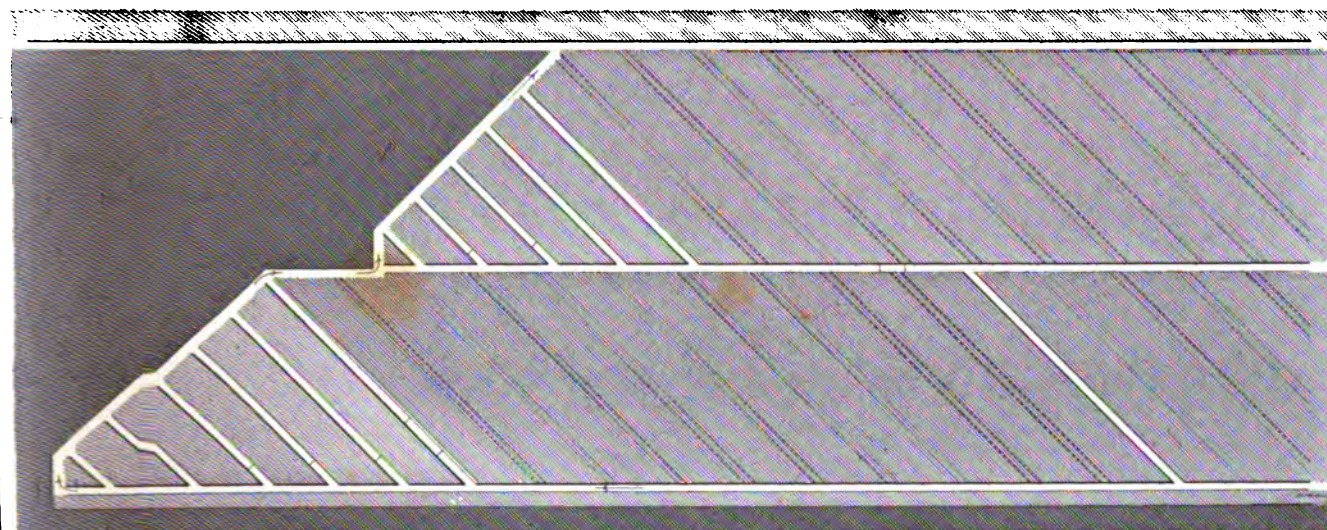


Fig. 2.
Couches inclinées
de 15° à 45°

MÉTHODE
PAR VOIES
demi tiernes
ou sur quartier.

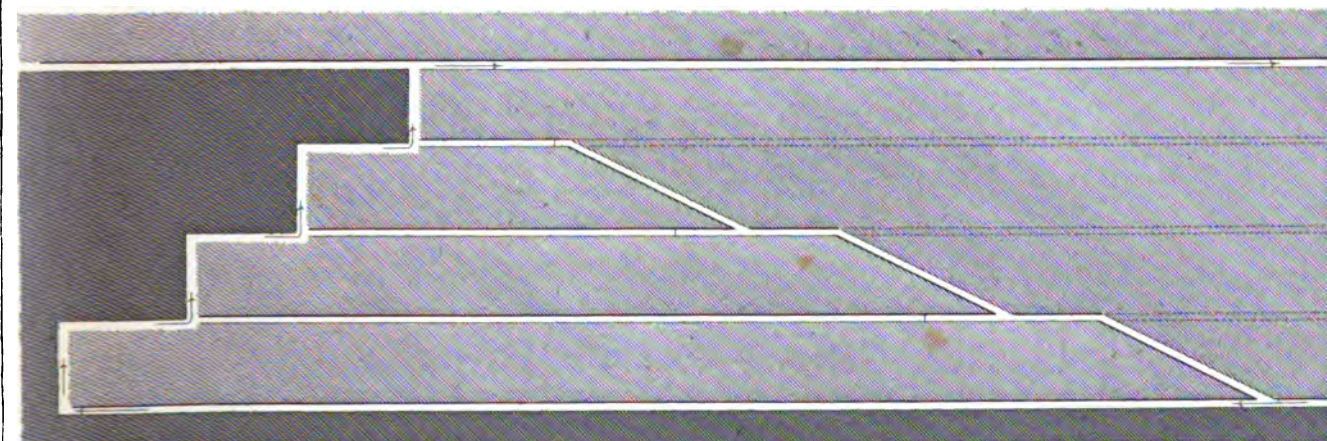


Fig. 3.
Couches inclinées
de 20° à 60°

MÉTHODE
PAR GRADINS
renversés
en chassage.

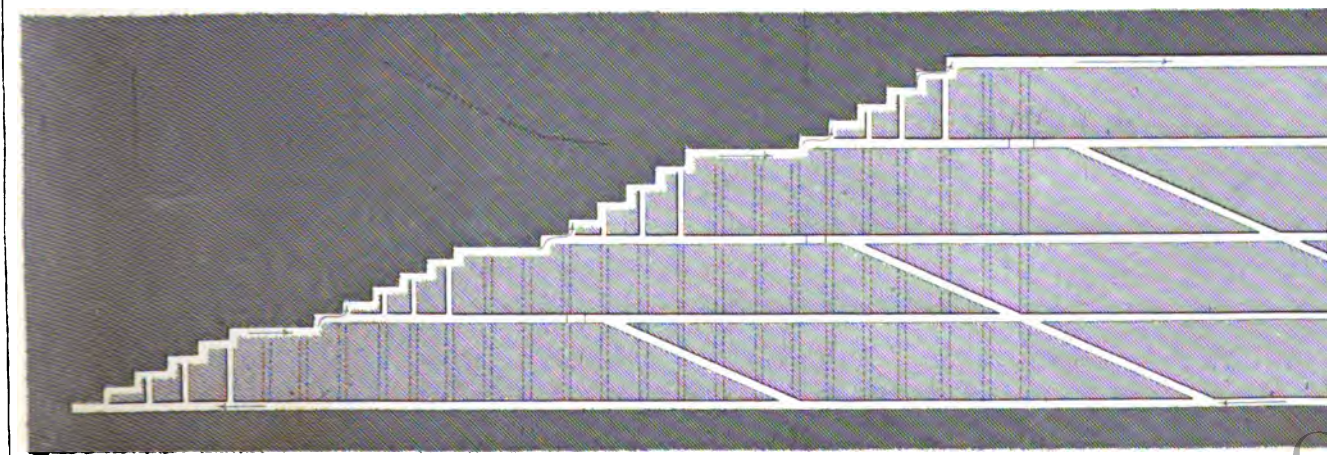


Fig. 4.
Couches inclinées
de 60° à 90°

MÉTHODE
PAR MAINTENAGES.

Fig. 1. Méthode des Long-Walls.

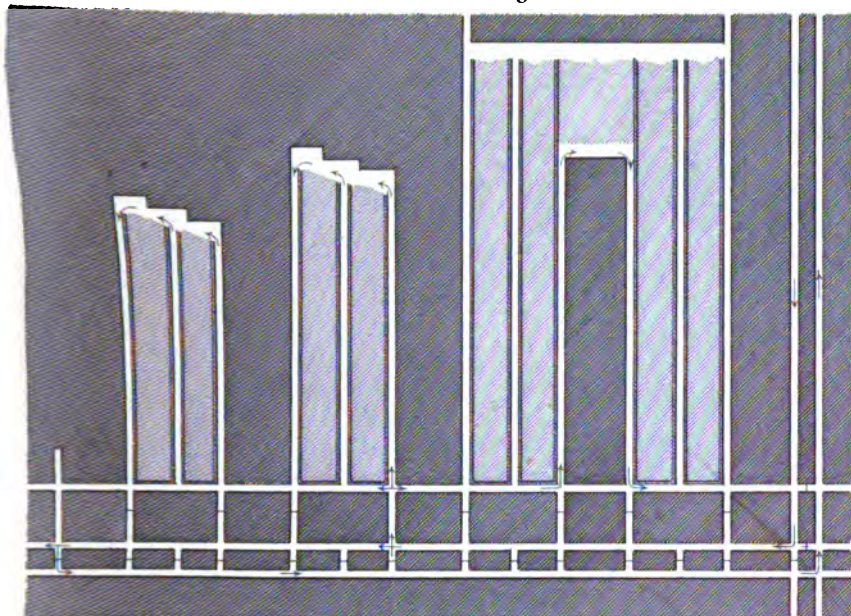


Fig. 2. Méthode des Pannels Works.

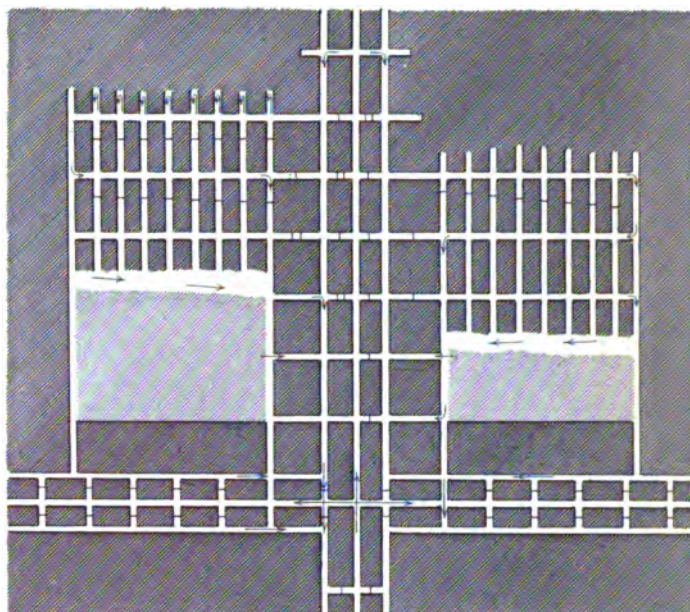


Fig. 3. Traçage des Piliers des Pannels Works.

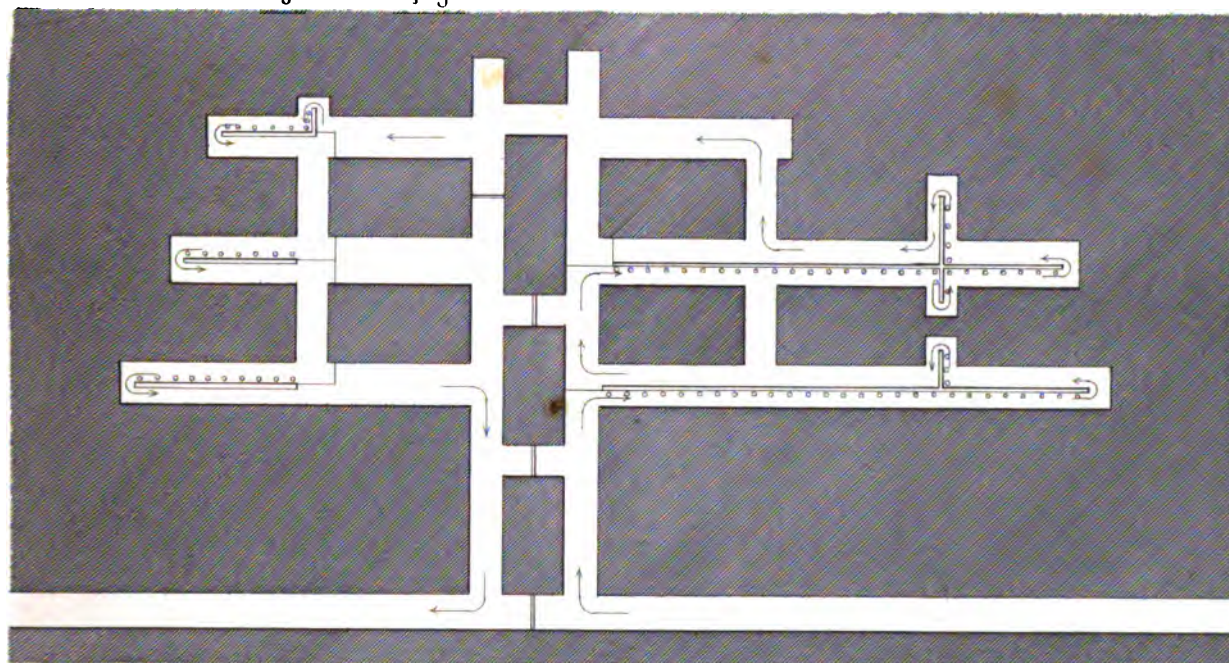
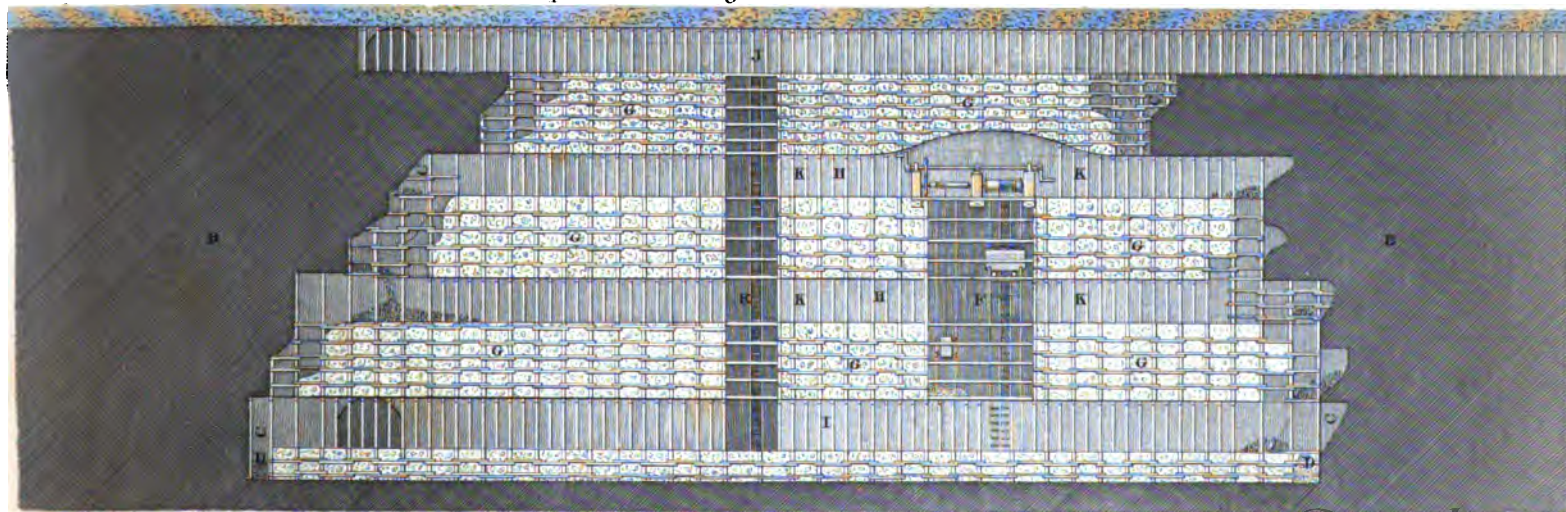


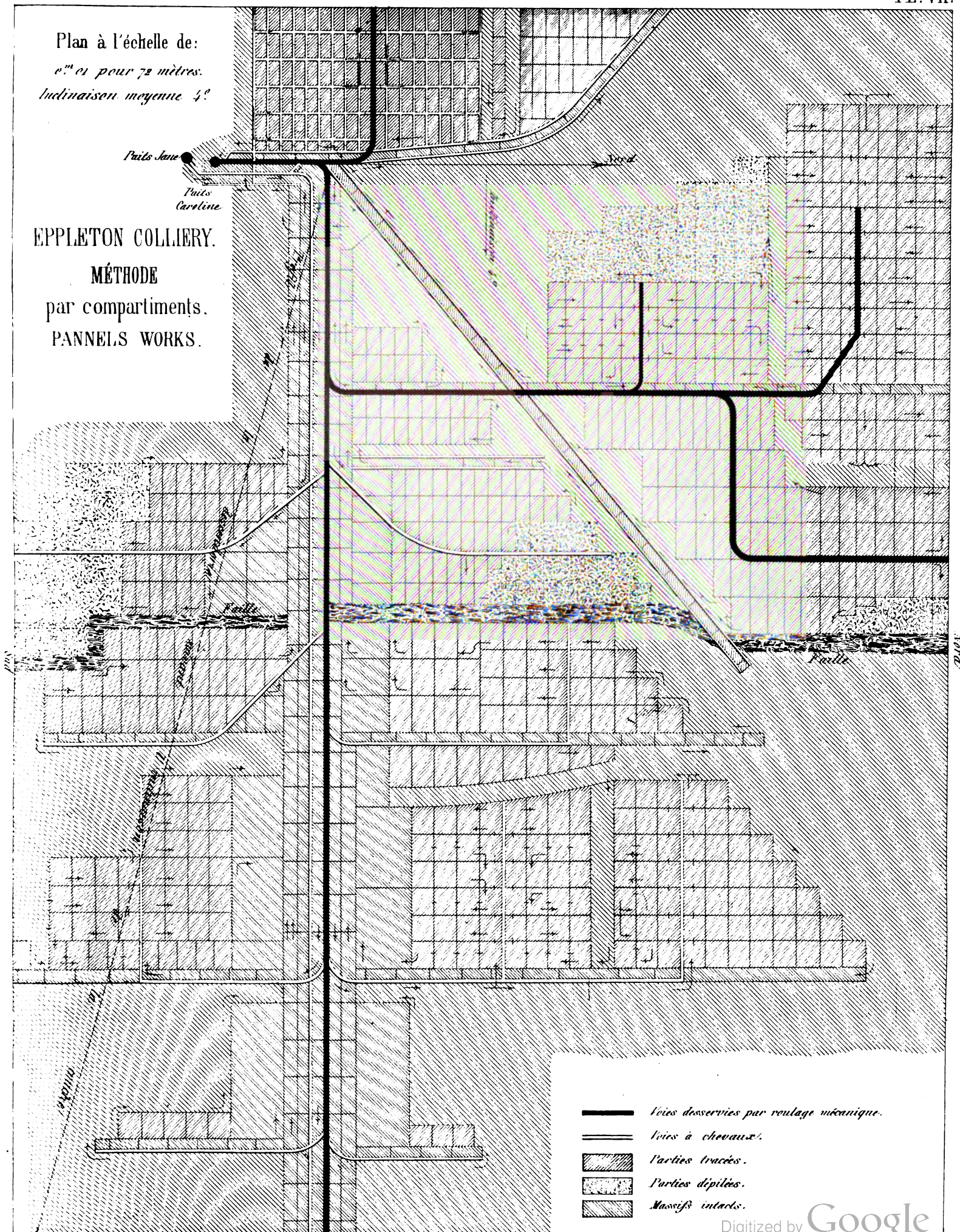
Fig. 4. Disposition des gradins renversés à Anzin.



Plan à l'échelle de:
1 cm pour 72 mètres.
Inclinaison moyenne 4°

EPPLETON COLLIERY.

MÉTHODE
 par compartiments.
 PANNELS WORKS.



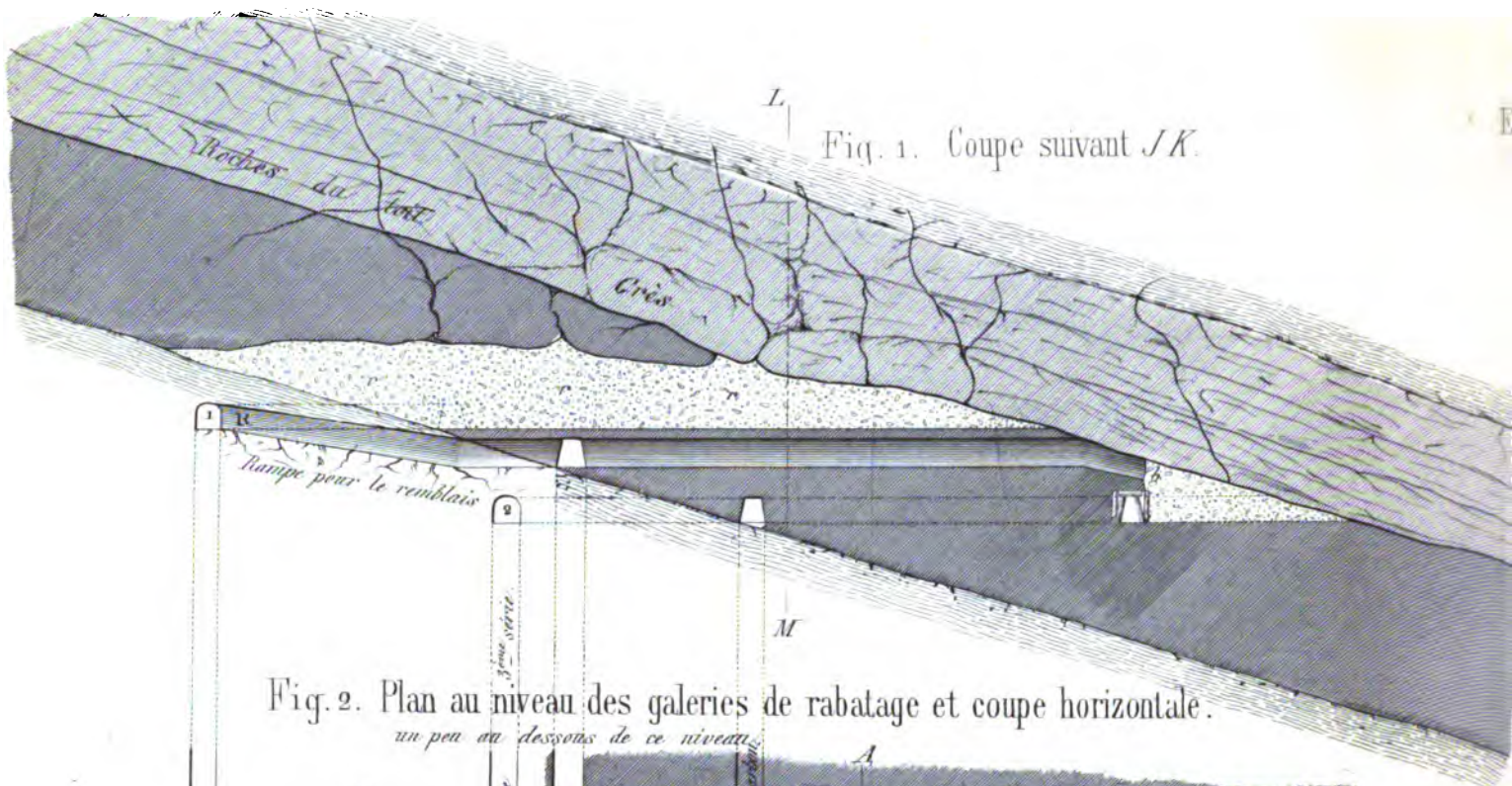
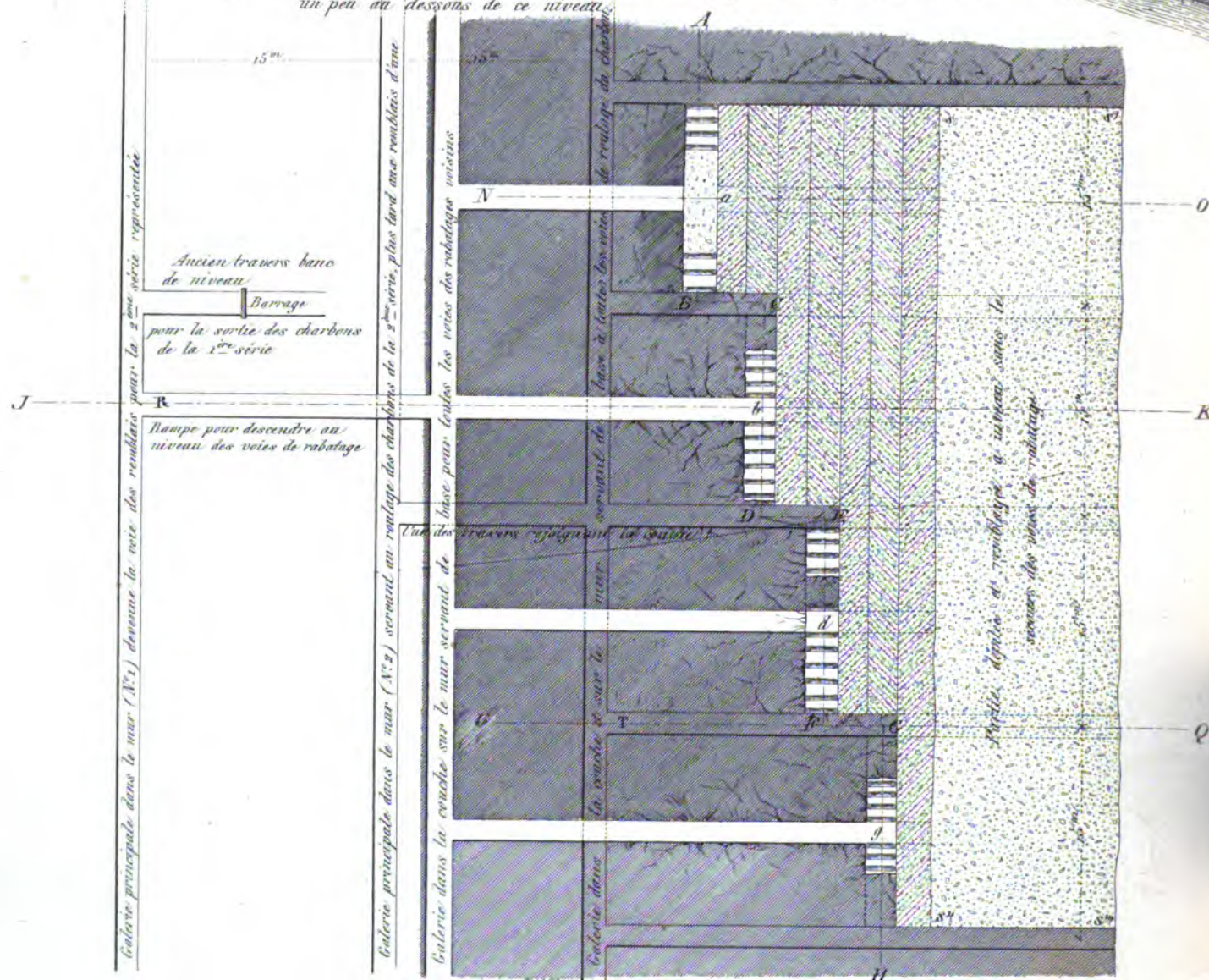


Fig. 2. Plan au niveau des galeries de rabatage et coupe horizontale.
un peu au dessous de ce niveau



EXTENSION D'UNE COUCHE DE 12 MÈTRES A MONTCEAU LES MINES
MÉTHODE PAR RABATAGE. TRANCHES DE 6 MÈTRES DE HAUTEUR.

Echelle de $\frac{1}{500}$

Fig.3. Coupe suivant *HGFEDCBA*.

Avec projection des voies de rabatage a b d g

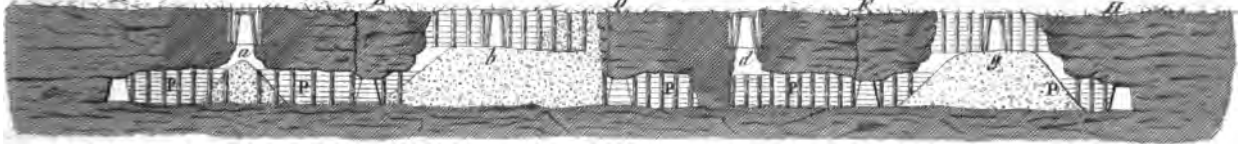
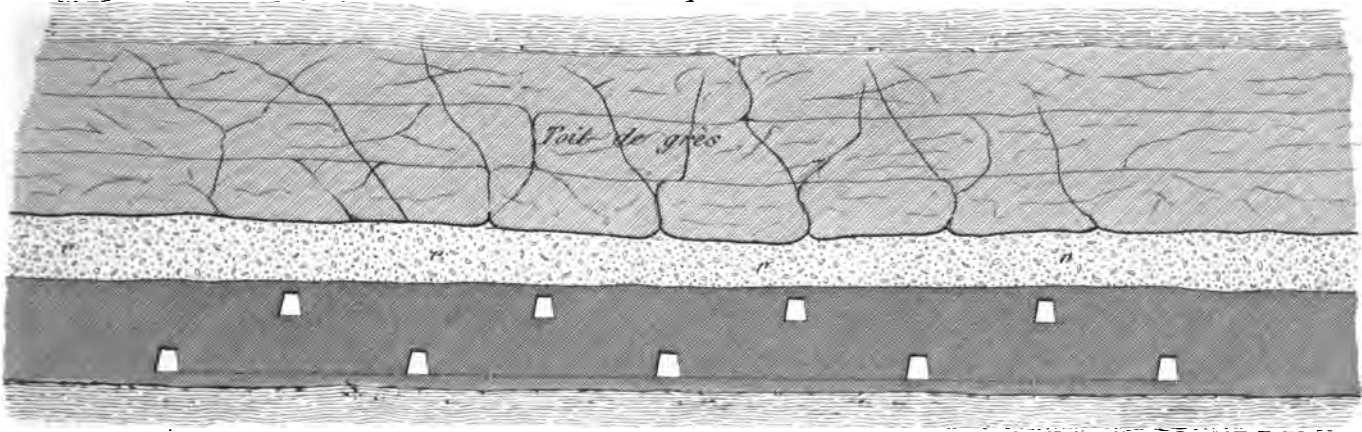


Fig.4. Coupe suivant *LM*.



DÉTAIL D'UN CHANTIER DE RABATAGE.

Fig.5. Coupe suivant *NO*.

Fig.6. Coupe suivant *UQ*.

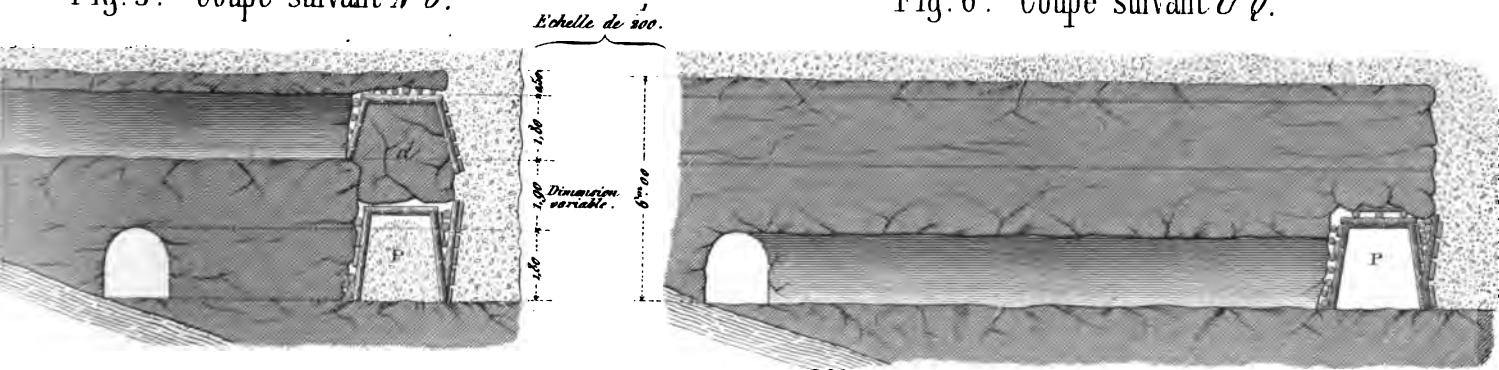


Fig. 3.

Plan de l'exploitation d'une grande couche
par tranches horizontales en s'élevant
sur les remblais.

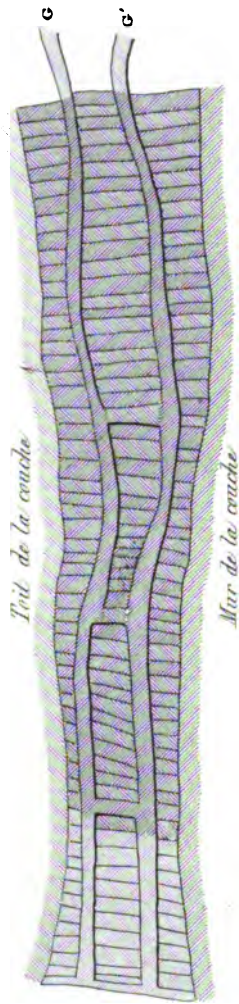


Fig. 1.

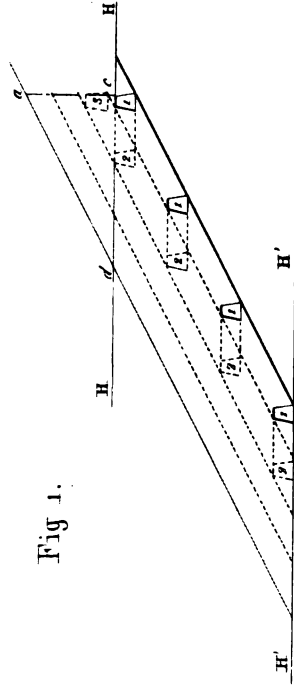
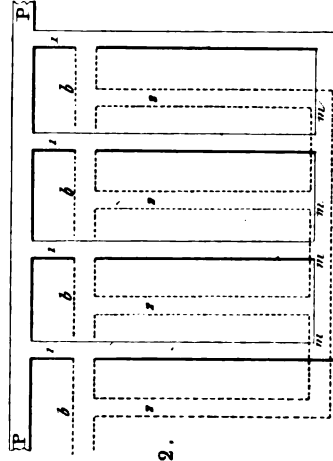


Fig. 2.



MÉTHODE PAR TRANCHES INCLINÉES
APPLIQUÉE A LUCY PRÈS MONTCEAU LES MINES.

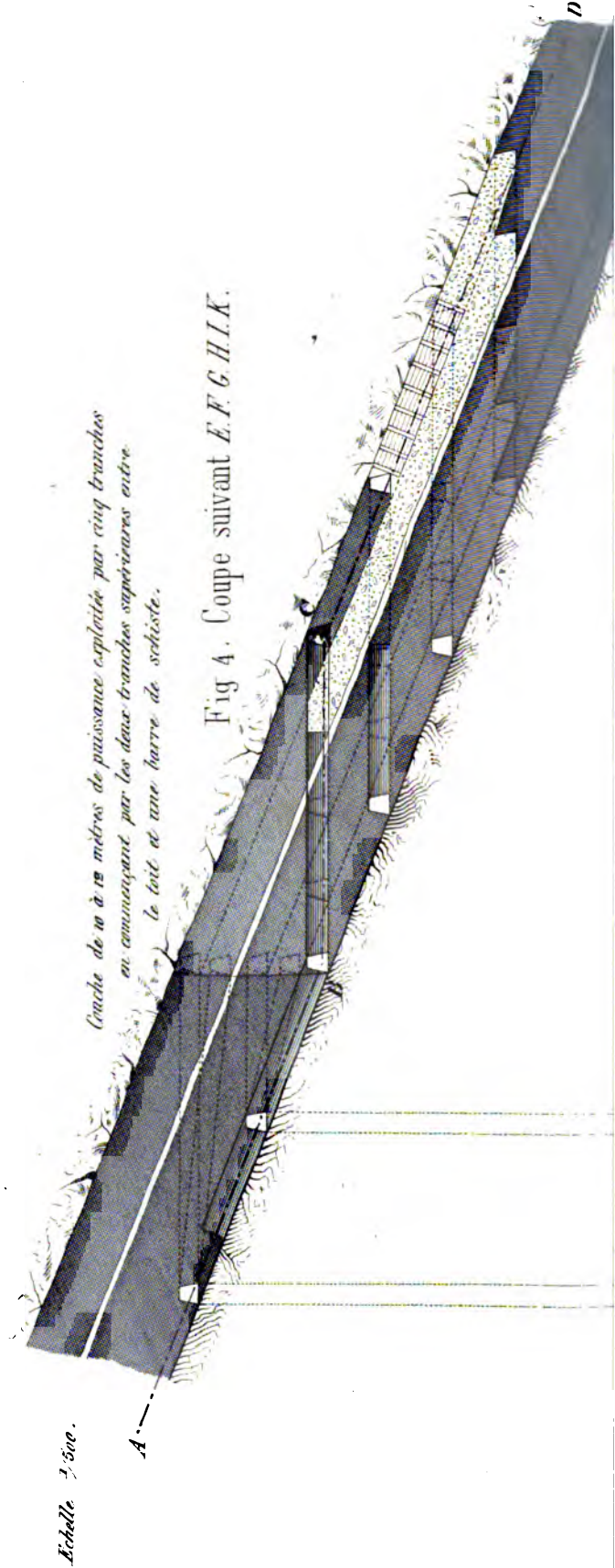


Fig. 4. Coupe suivant E.F.G.H.I.K.

Tranche de 10 à 15 mètres de puissance exploitée par cinq tranches
en commençant par les deux tranches supérieures entre
le toit et une barre de schiste.

Echelle 1/500.

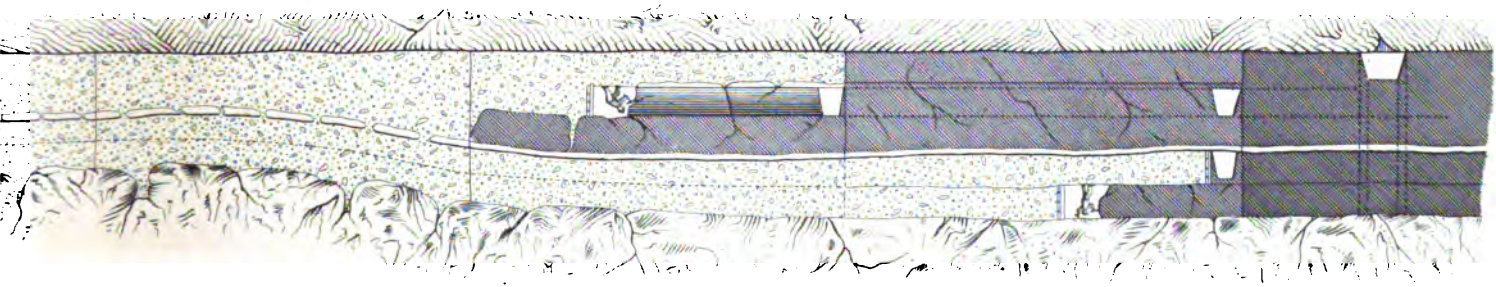
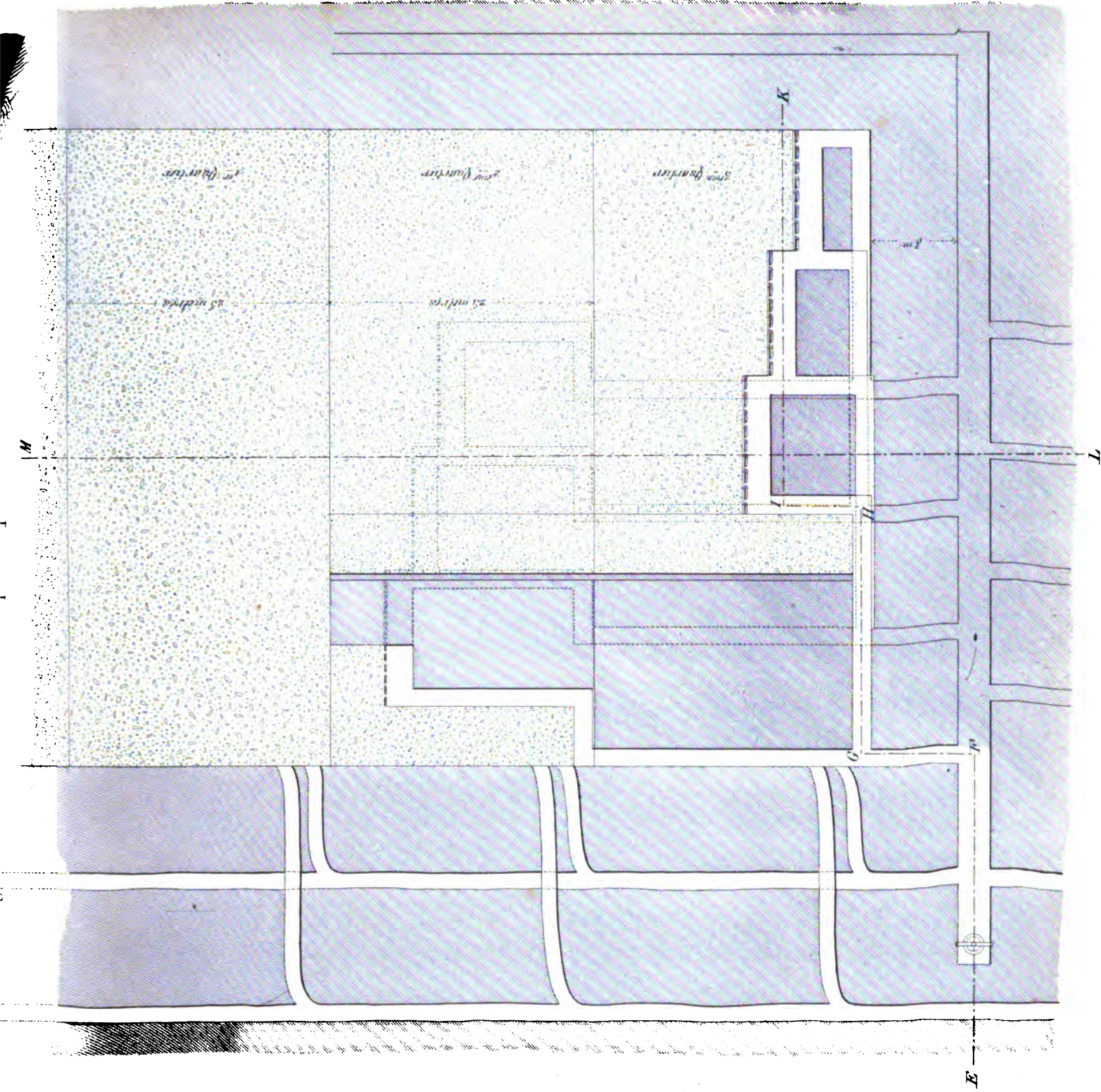
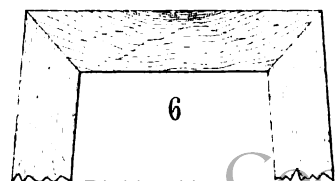
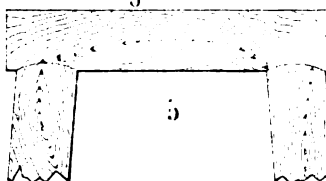
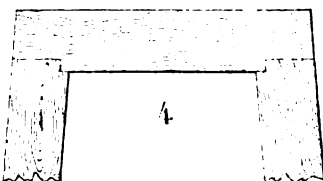
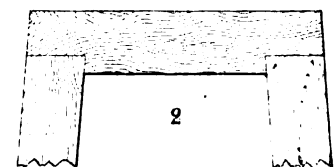
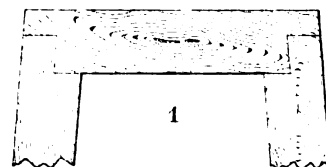
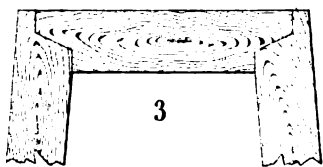
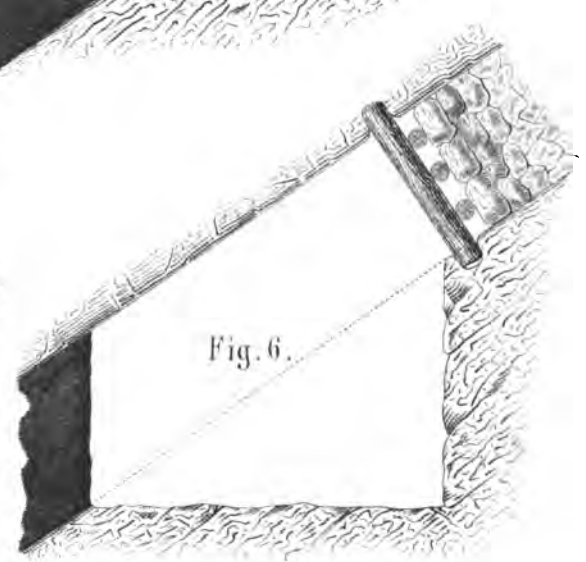
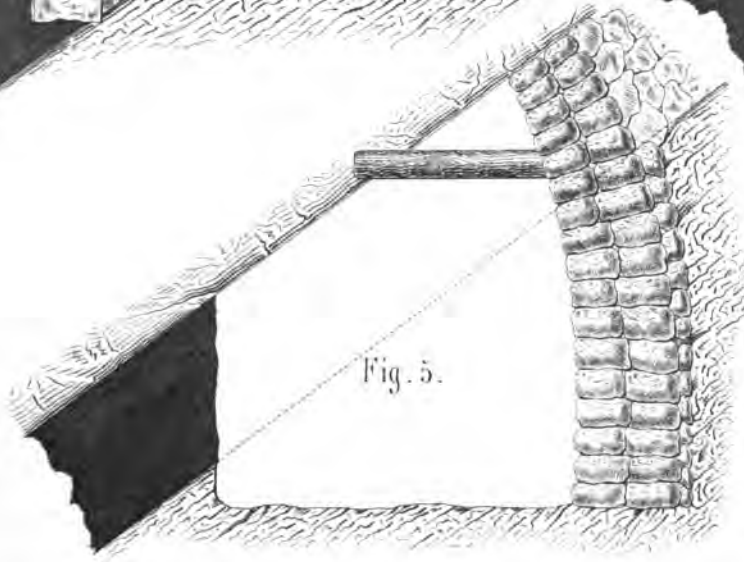
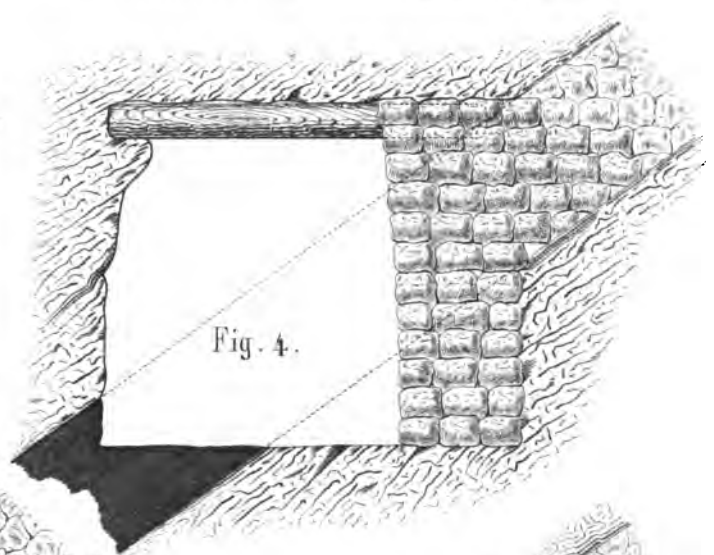
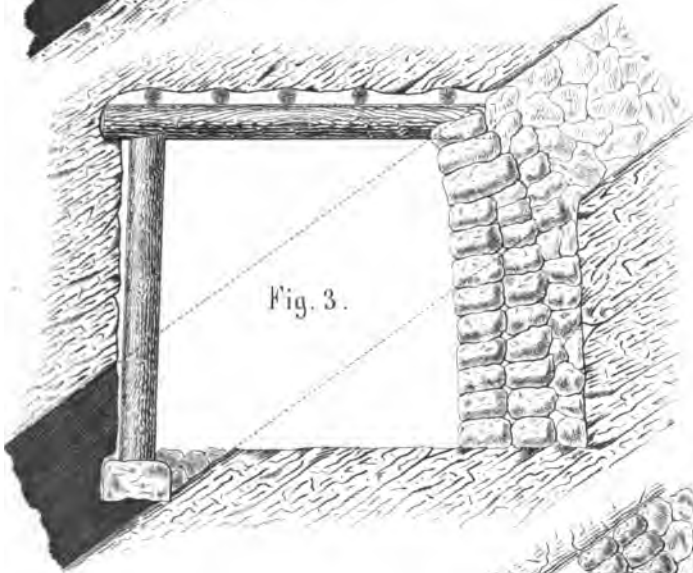
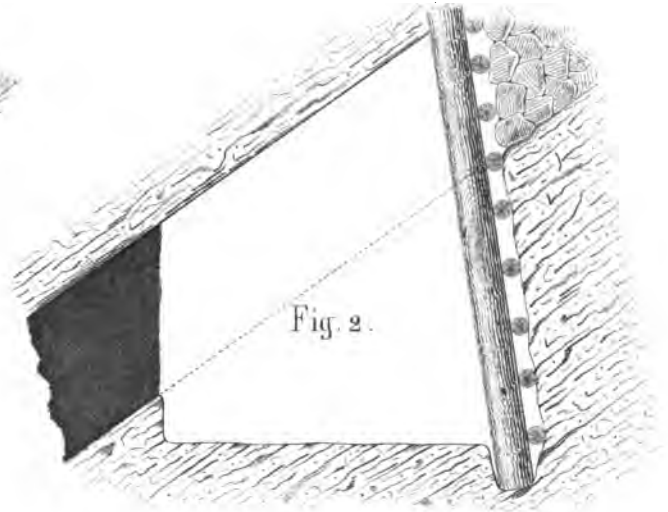
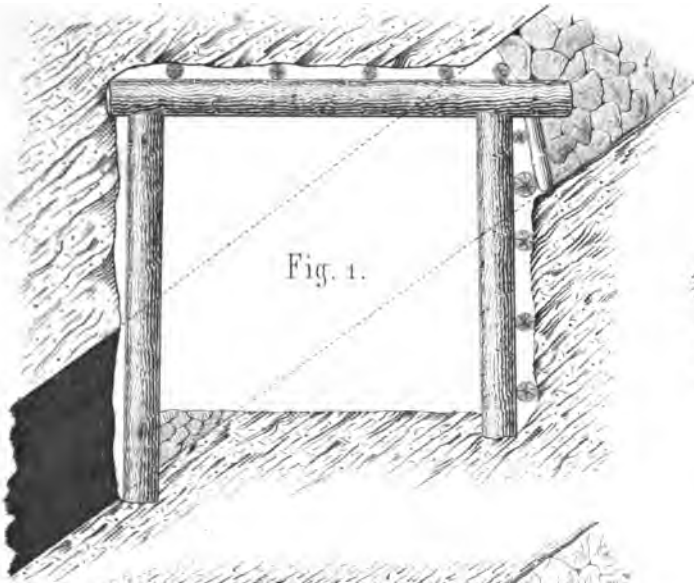


Fig. 5. Coupe suivant Z M.

Etat d'occupation à l'entrée à l'ouest.

Soutènement des costresses.



Assemblage des cadres.

GALERIE D'ENGIS. PROCÉDÉ VICTOR SIMON.

Fig. 1.

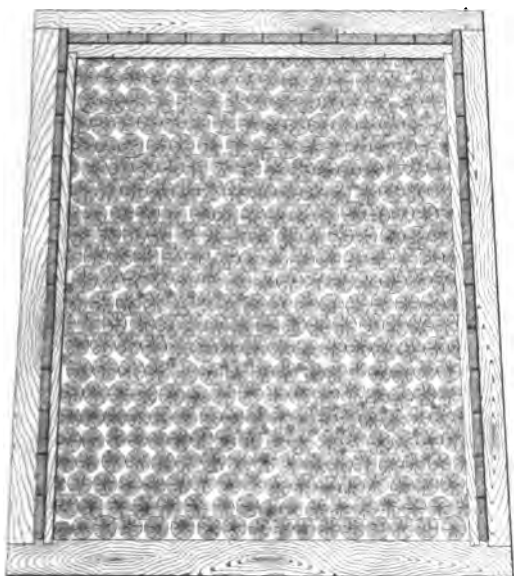


Fig. 2.



Fig. 3.

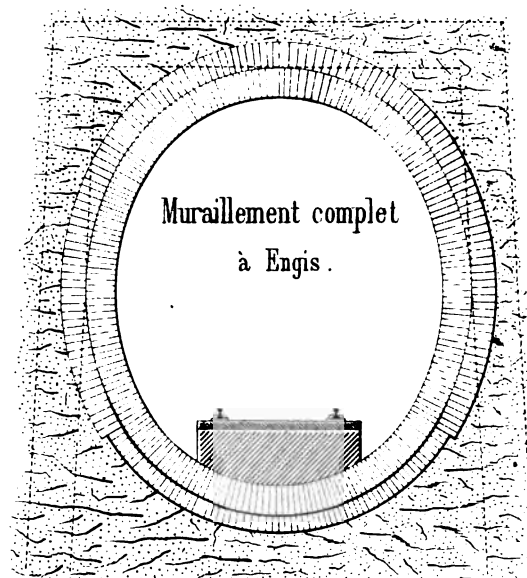
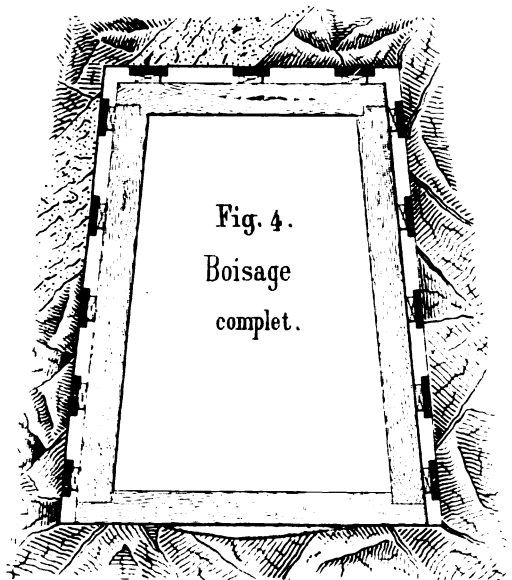
Fig. 4.
Boisage
complet.Fig. 5.
Muraillage inscrit dans
le boisage à Engis.Fig. 6.
Muraillage
complet.

Fig. 8.

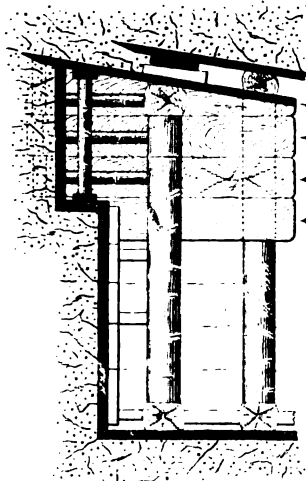


Fig. 7.

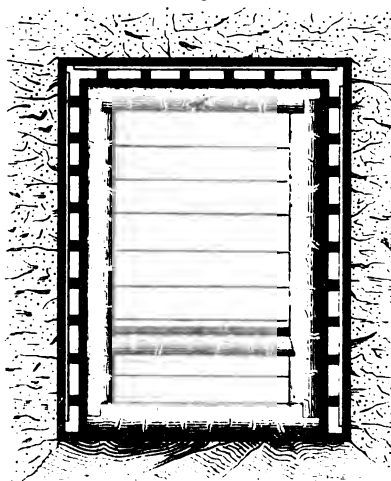
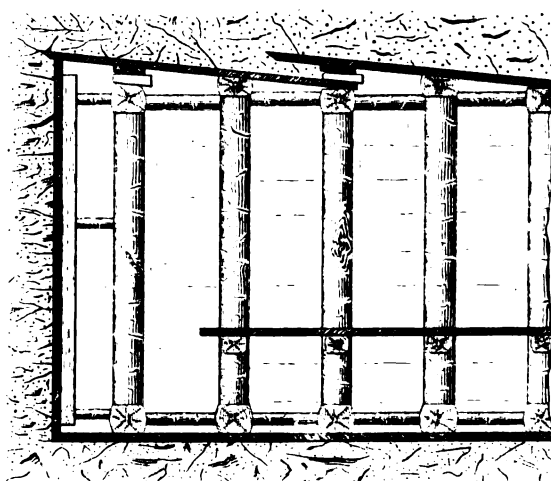


Fig. 9.



7.8.9. Percement d'une galerie dans les terrains ébouleux.

SOUTÈNEMENT DES GALERIES EN FER. (SYSTÈME ROBERT.)

Fig. 1. Coupe transversale.

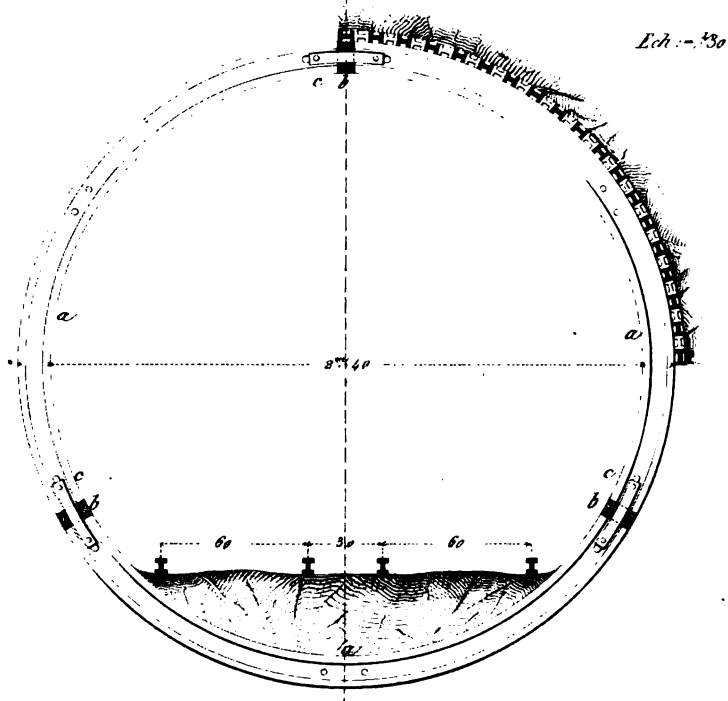
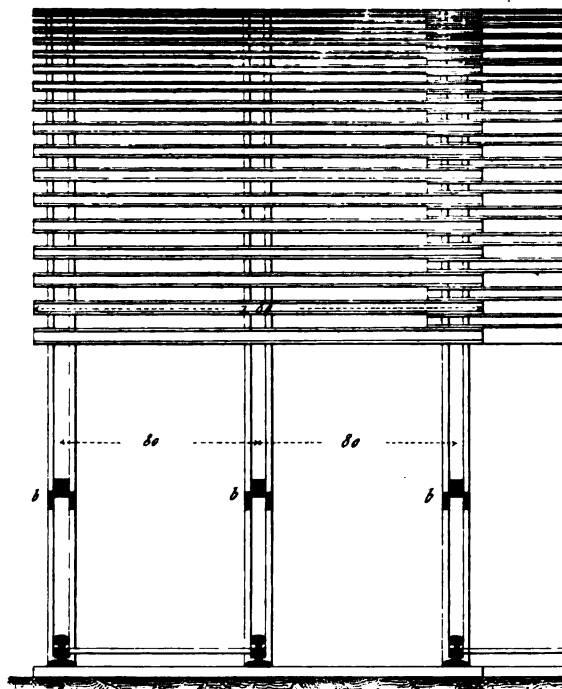


Fig. 1. Elévation et Coupe longitudinale.



SOUTÈNEMENT DES GALERIES EN FONTE. (SYSTÈME ROGER)

Fig. 2. Coupe transversale.

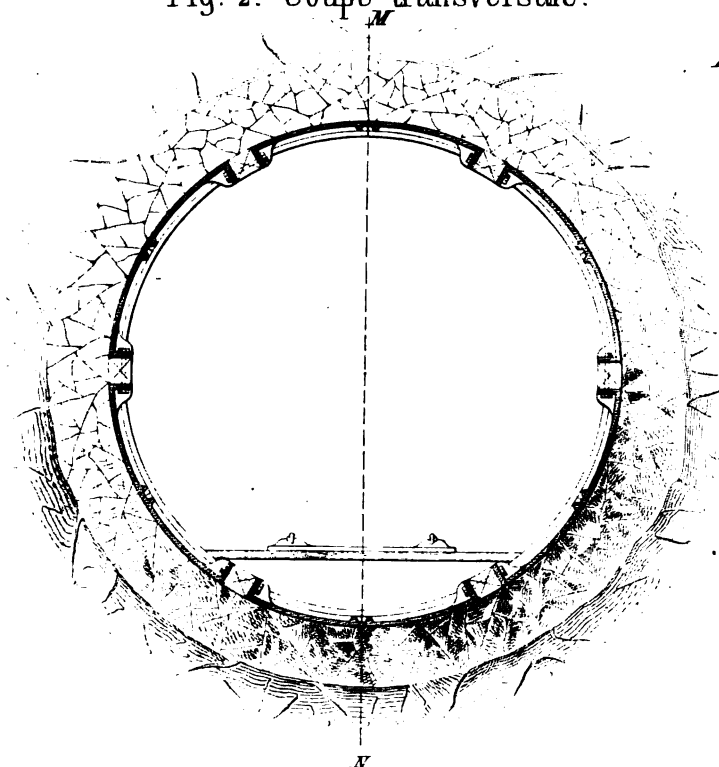


Fig. 2. Coupe longitudinale.

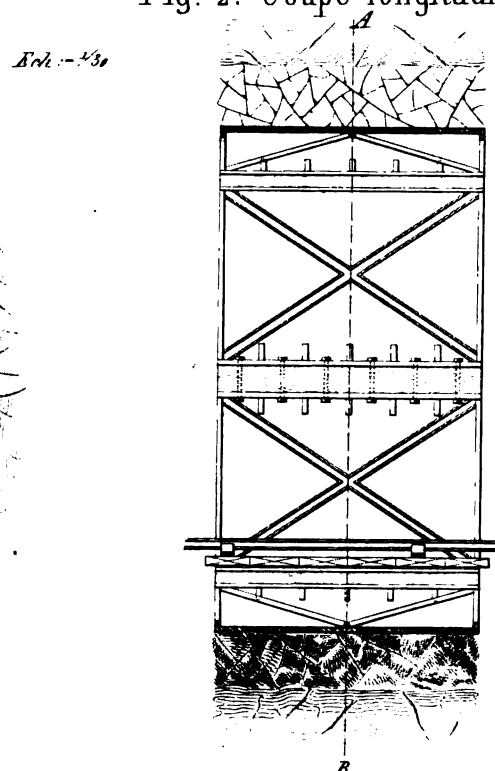


Fig. 3. Tunnel du canal de S^t Quentin.
Percement et muraillement dans les fondis.

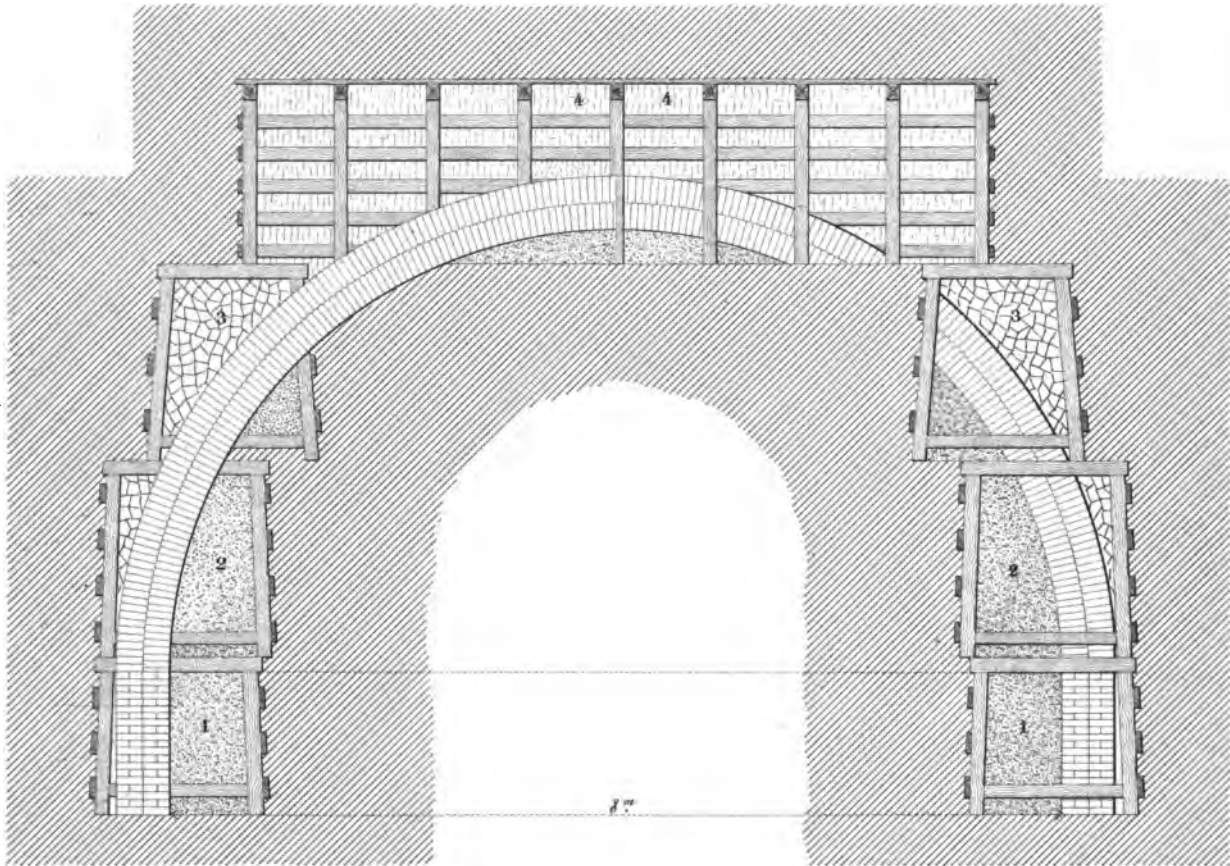
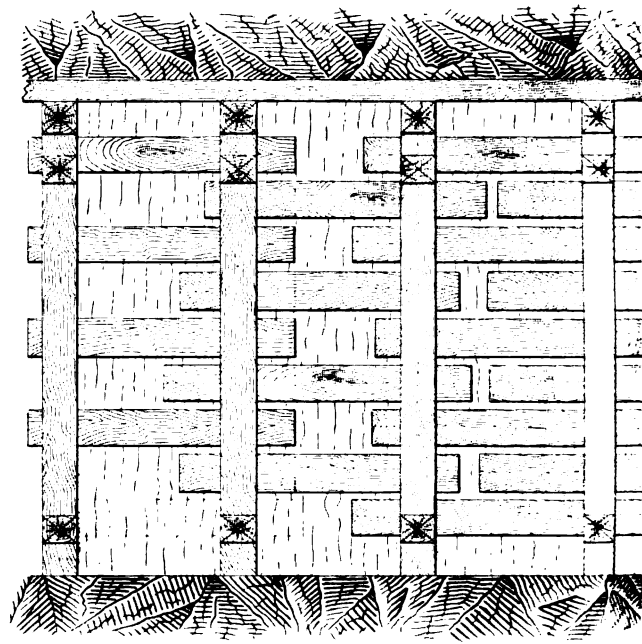
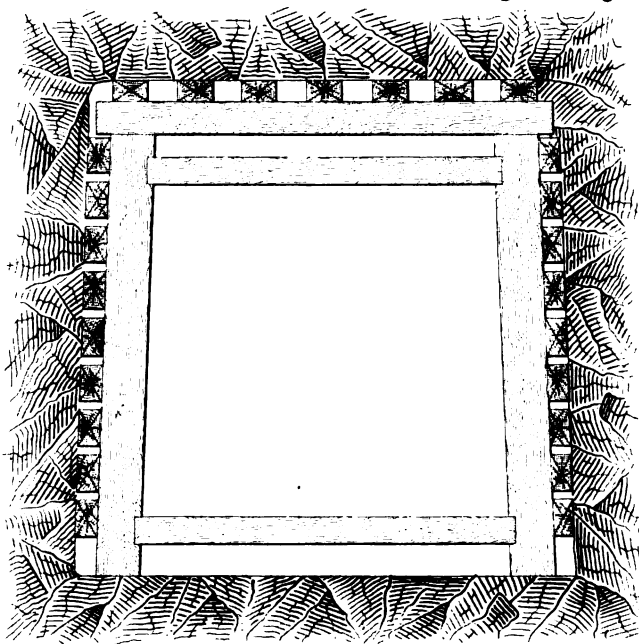


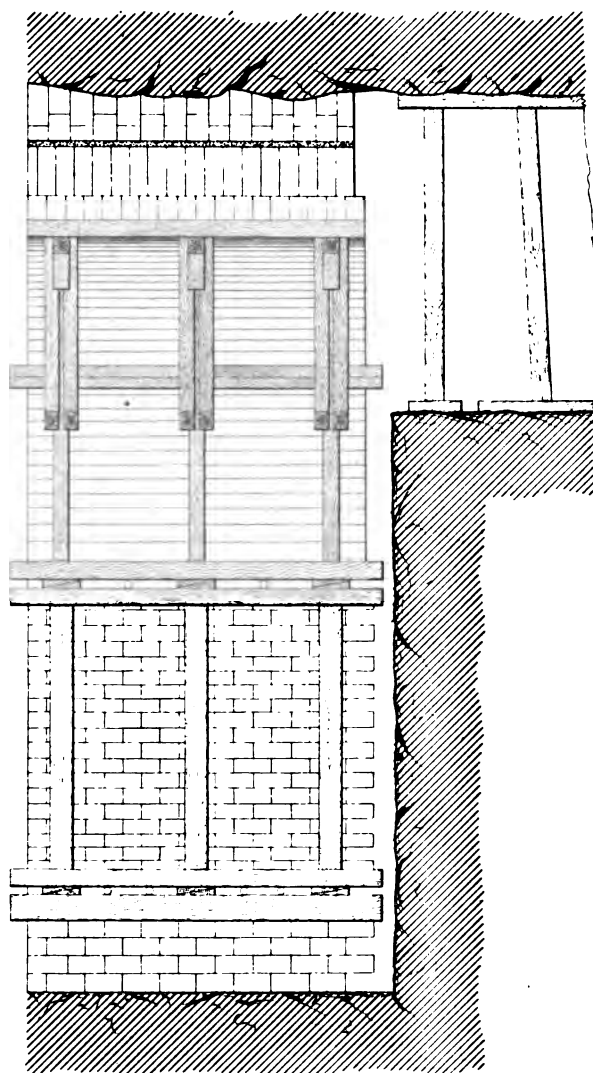
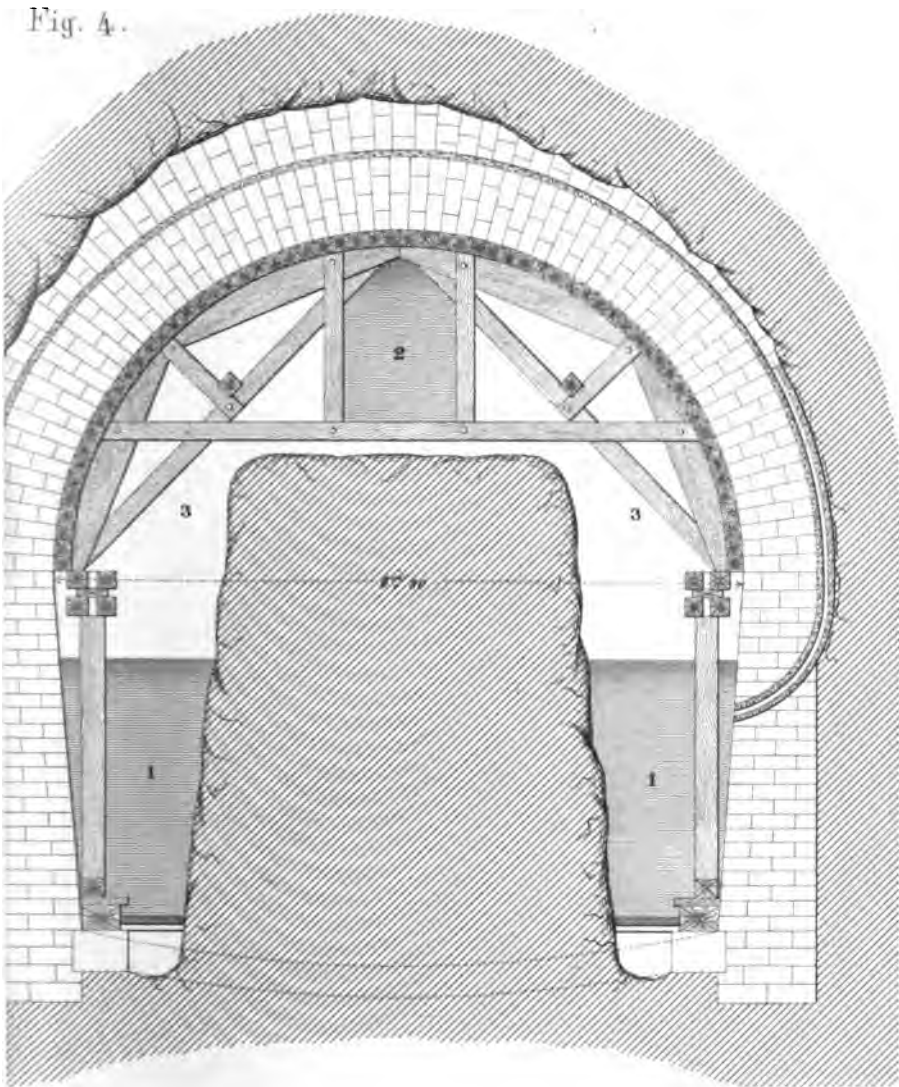
Fig. 2. Boisage des galeries dans les fondis.



Tunnel du canal de Bourgogne.

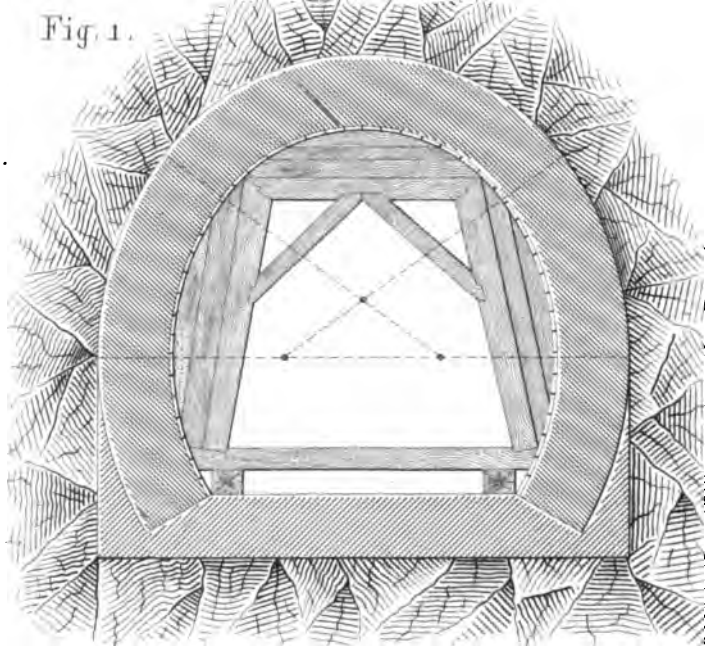
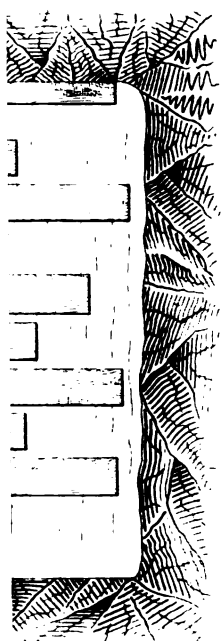
Fig. 5.

Fig. 4.



Galerie murillée d'Himmelfart.

Fig. 1.



TUNNEL DU CANAL DE CHARLEROY.

Fig. 1. Taille à l'avancement.

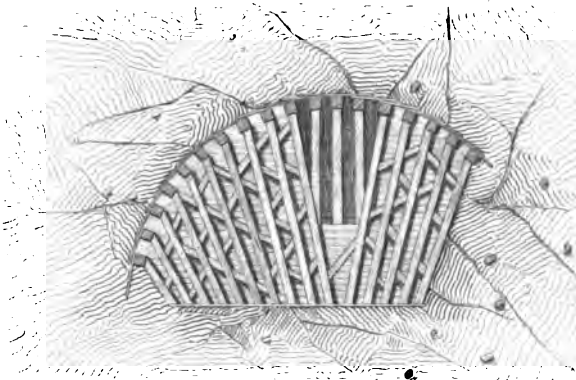


Fig. 2. Cintrage et muraillement.

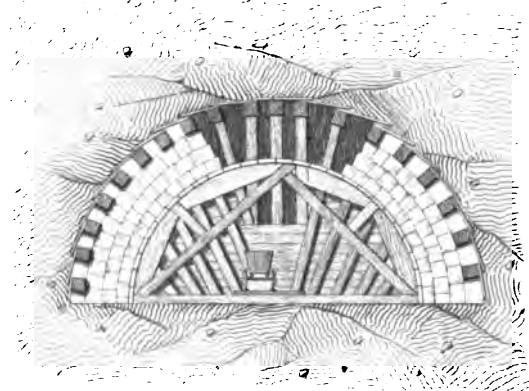


Fig. 3. Coupe longitudinale.

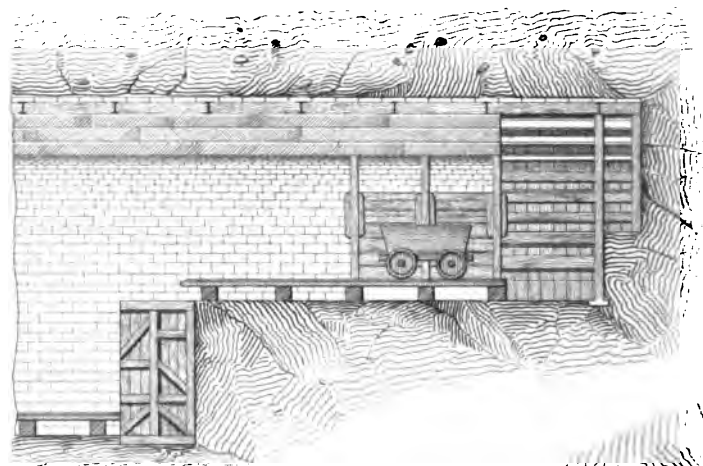
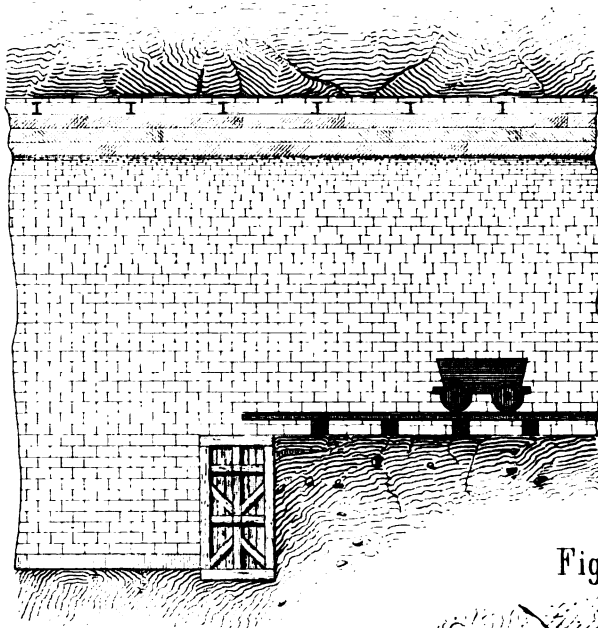


Fig. 8.

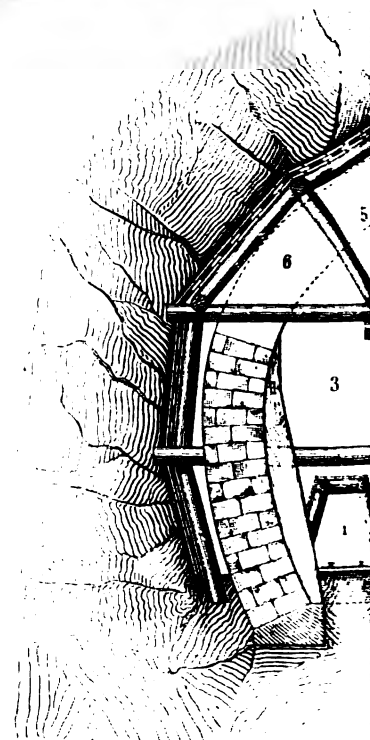
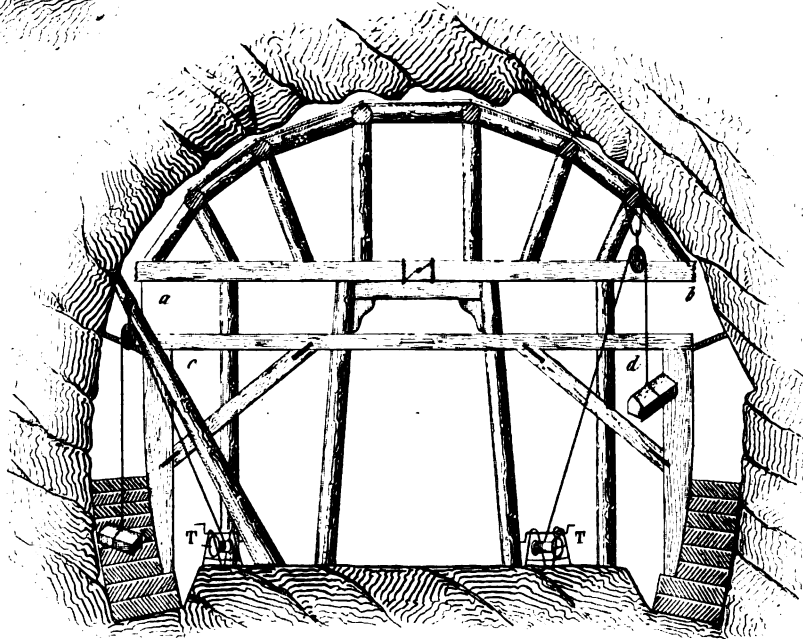


Fig. 4.
TUNNEL DE MONTREUIL.

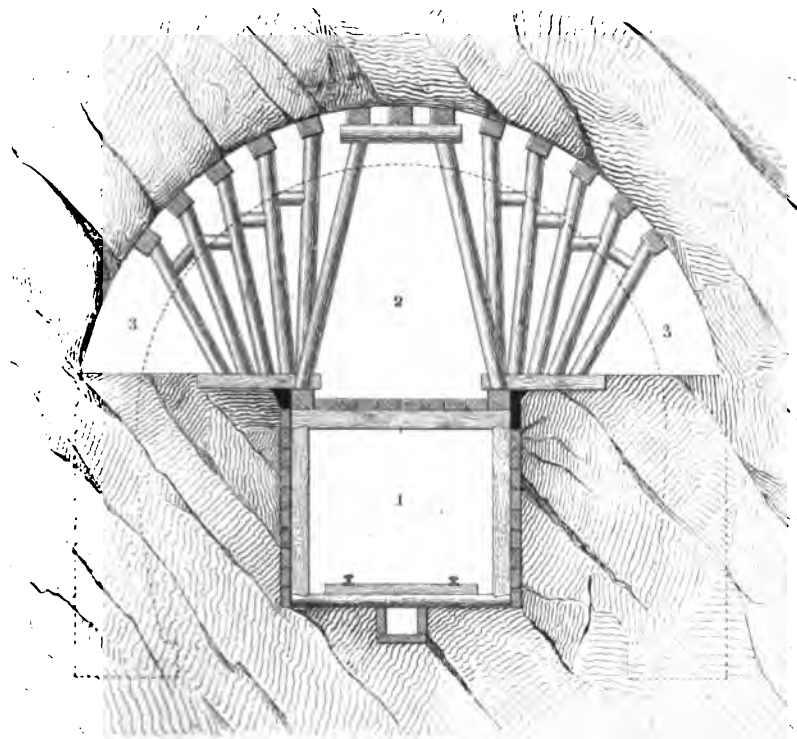


Fig. 5.
TUNNEL SUR LA LIGNE DE
VIENNE-TRIESTE.

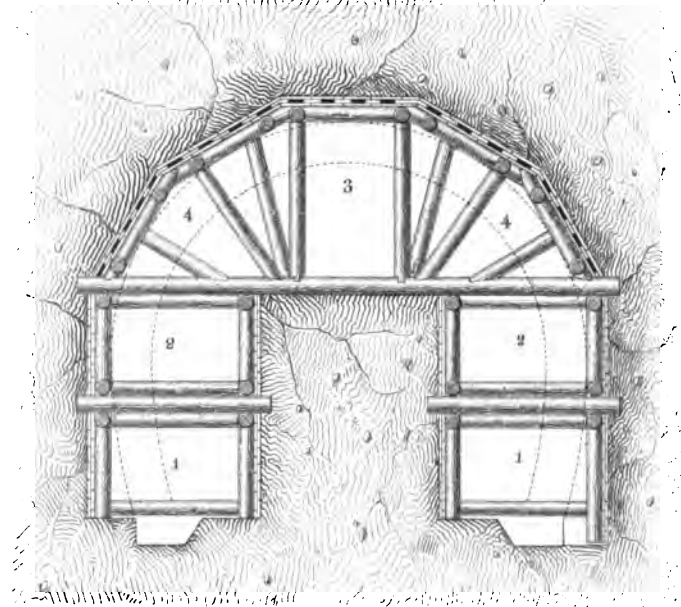
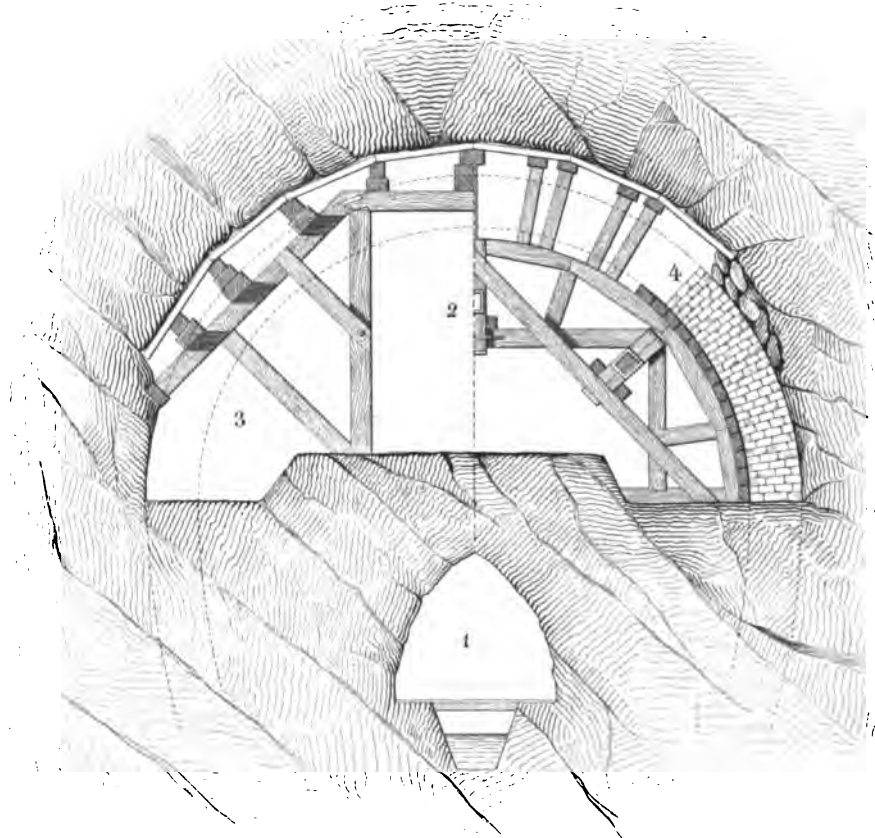
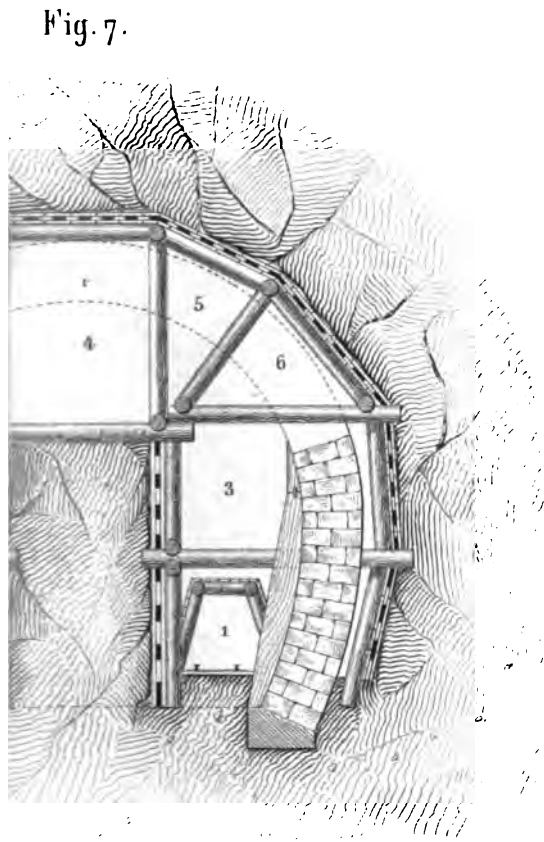


Fig. 6.
TUNNEL DE RILLY.



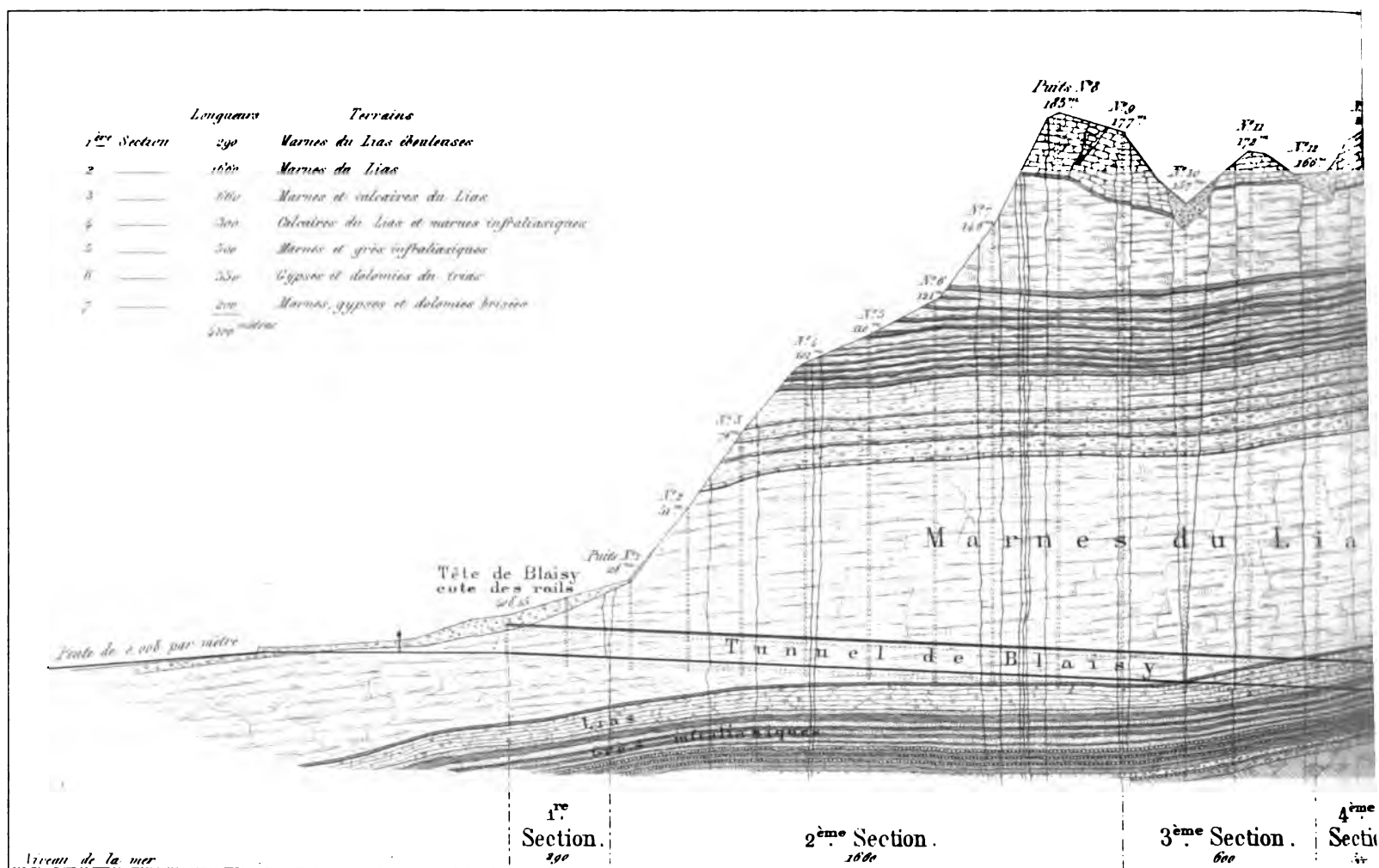
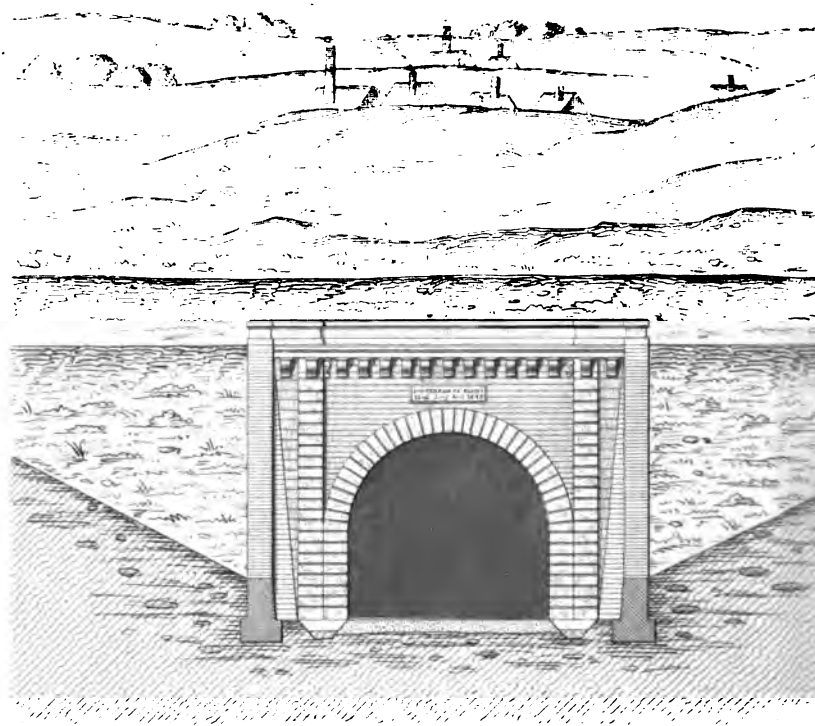
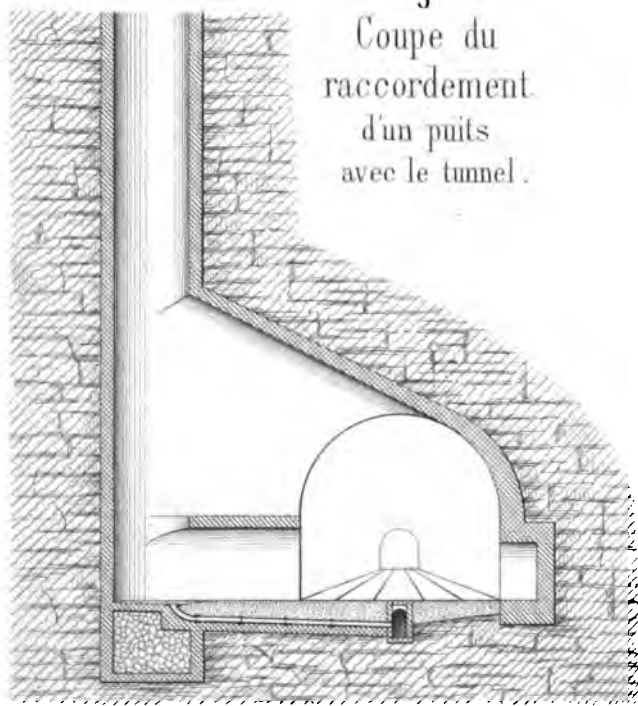


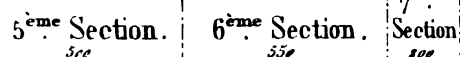
Fig. 9. Tête du tunnel. Côté de Malain.

Ech : 0.003.

Fig. 2.
Coupe du
raccordement
d'un puits
avec le tunnel.



Echelle des longueurs. 0,0005.
Echelle des hauteurs. 0,0005



Coupes du muraillement .
Fig. 4. 2^{ème} Section .

Fig. 7. 5^{ème} Section.

Fig. 7. 5^{ème} Section.

Fig. 8. 6^{ème} Section.

Fig. 1.

Première attaque de la section
par une galerie directrice.
Boisage inférieur.

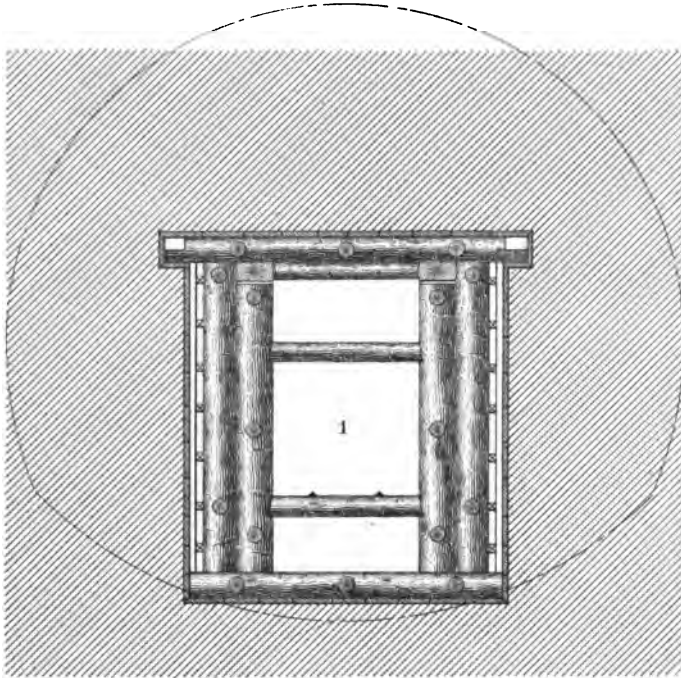


Fig. 2. Deux Boisage

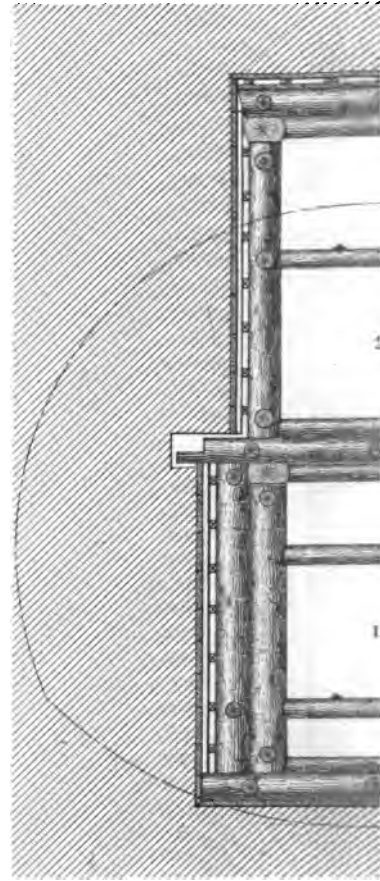
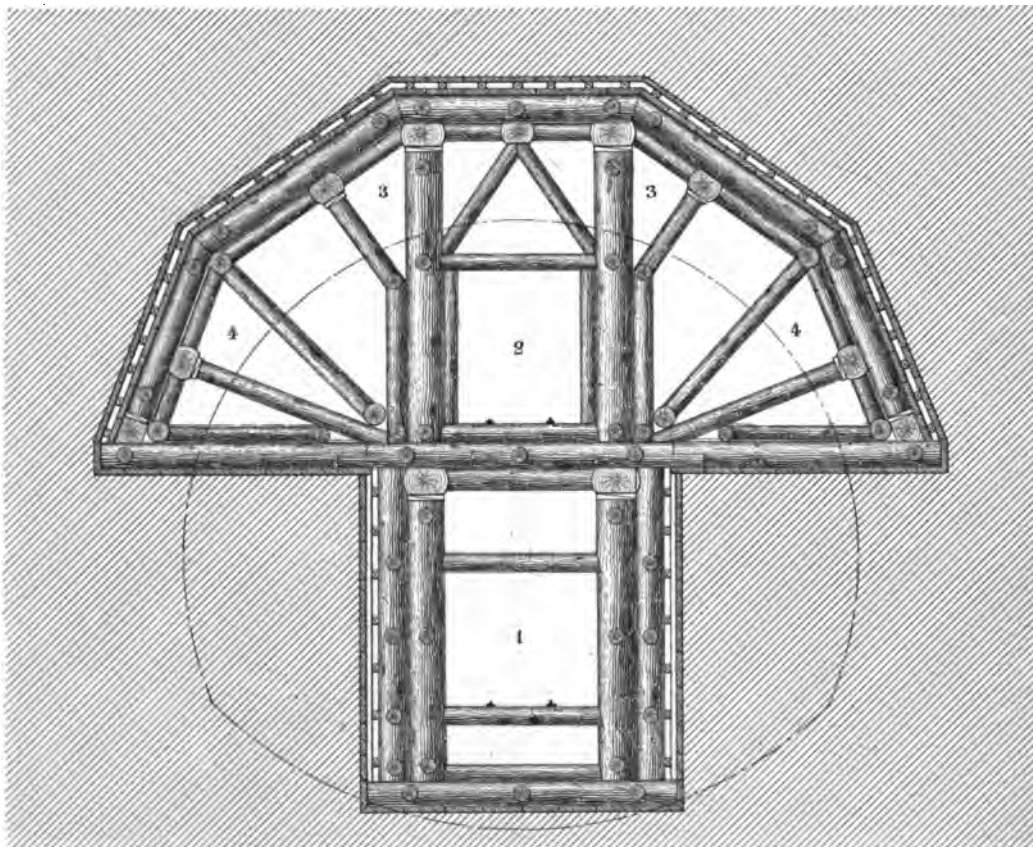


Fig. 4. Élargissement. Pied du boisage.



MÉTHO
AUTRICHI

Echelle :

ème galerie.
supérieur.

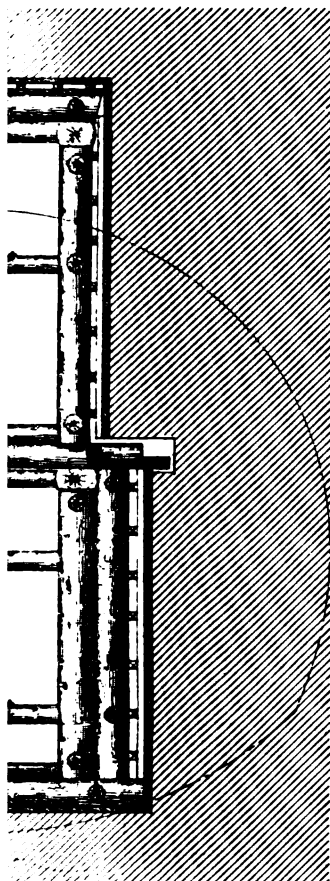


Fig. 3. Élargissement.
Boisage latéral.

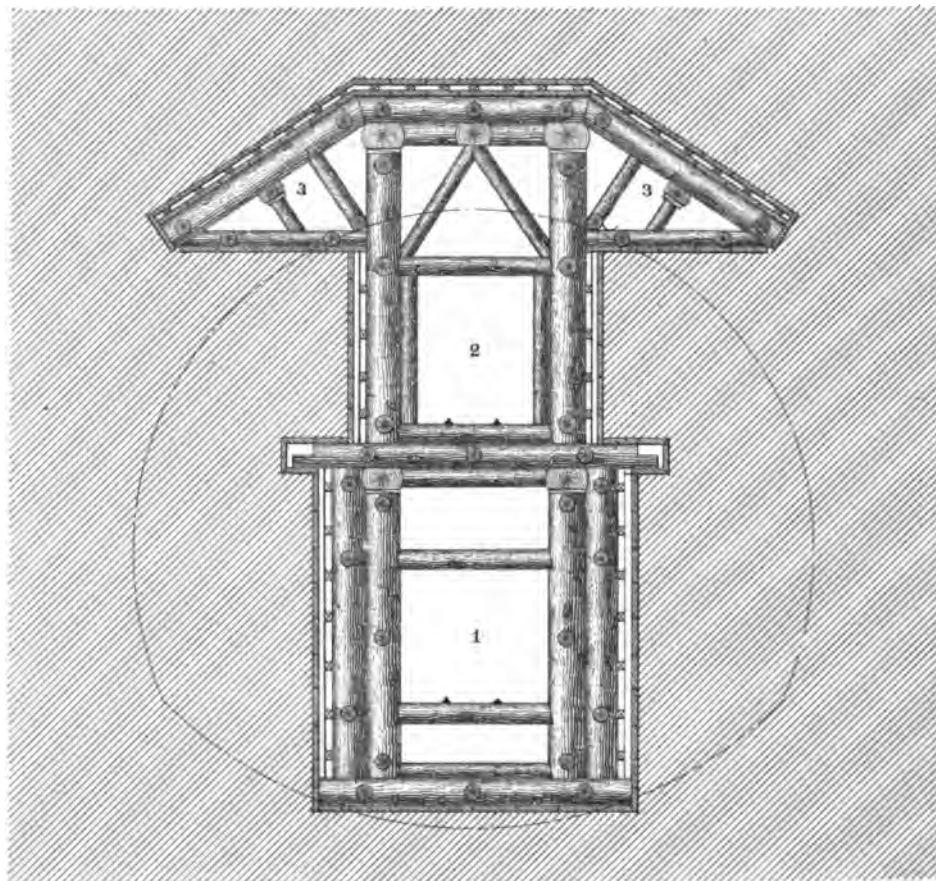
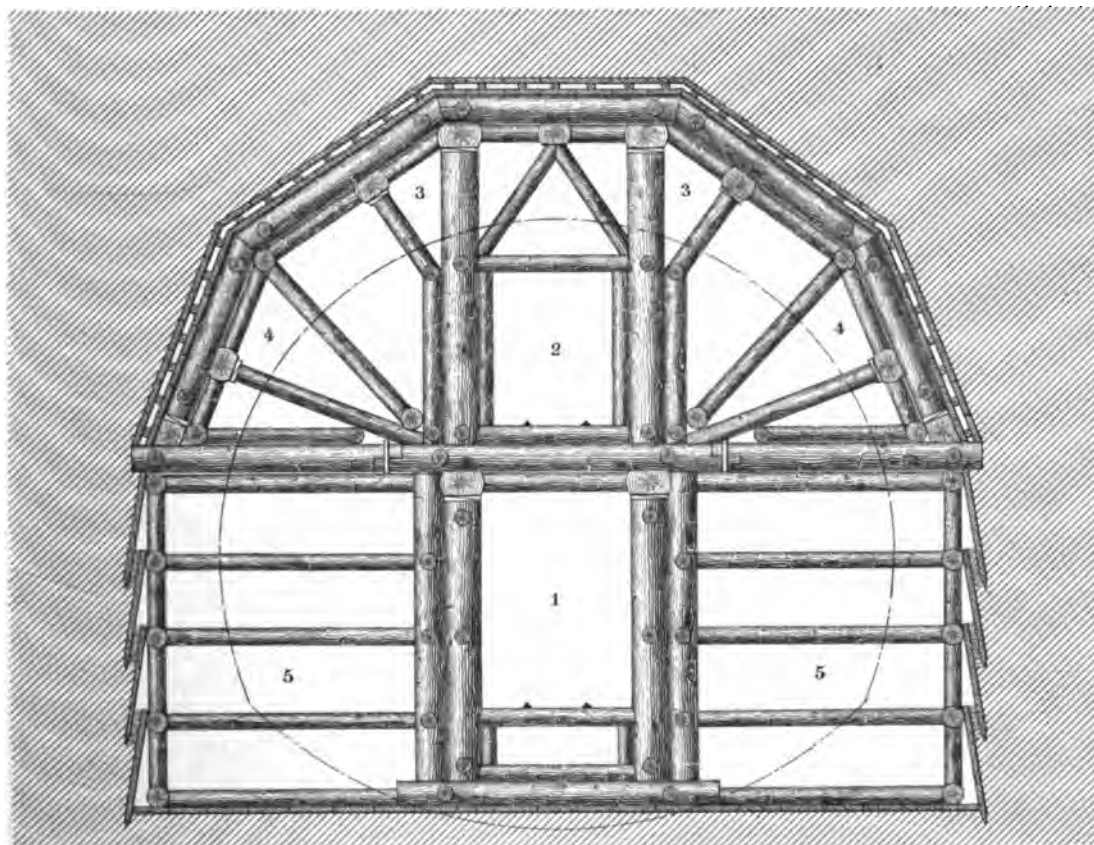


Fig. 5. Section totale. Boisage complet.



E
VNE.

.01.

dry, à liège.

Fig. 1. Fondation et construction des pieds droits.

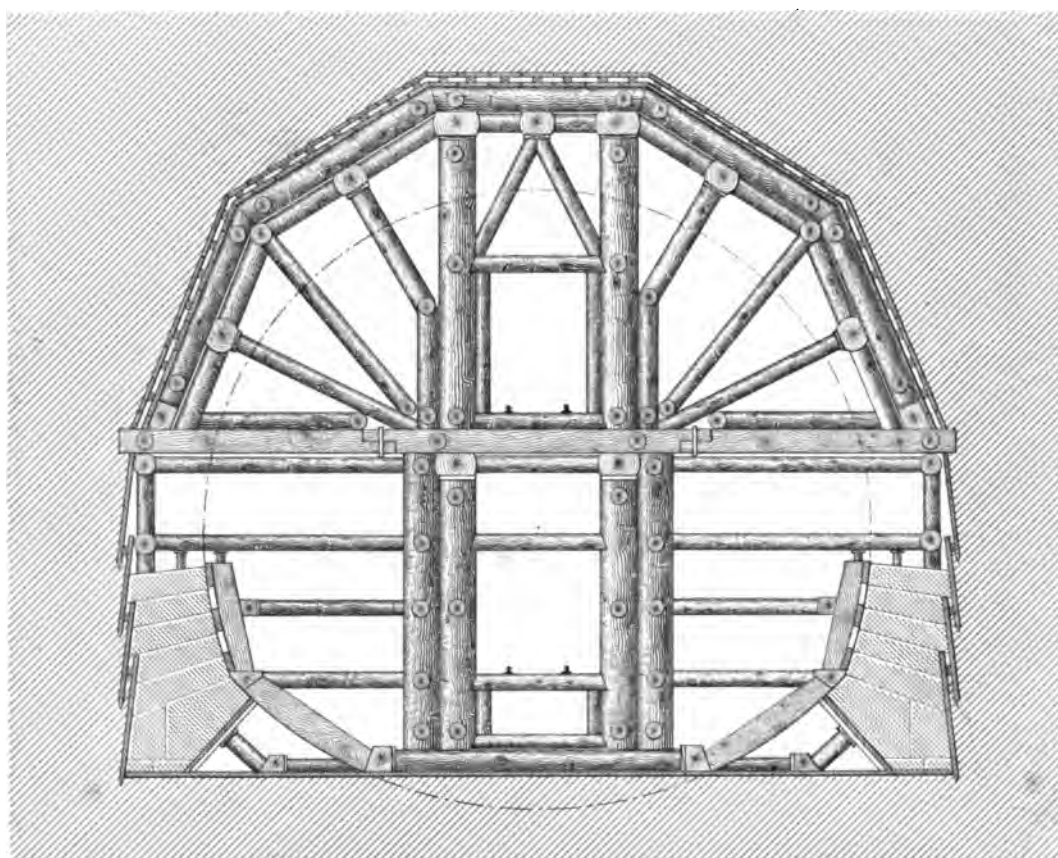
MÉTOD
AUTRICHIENNE*Echelle*

Fig. 3. Cintrage et construction de la voute renversée.

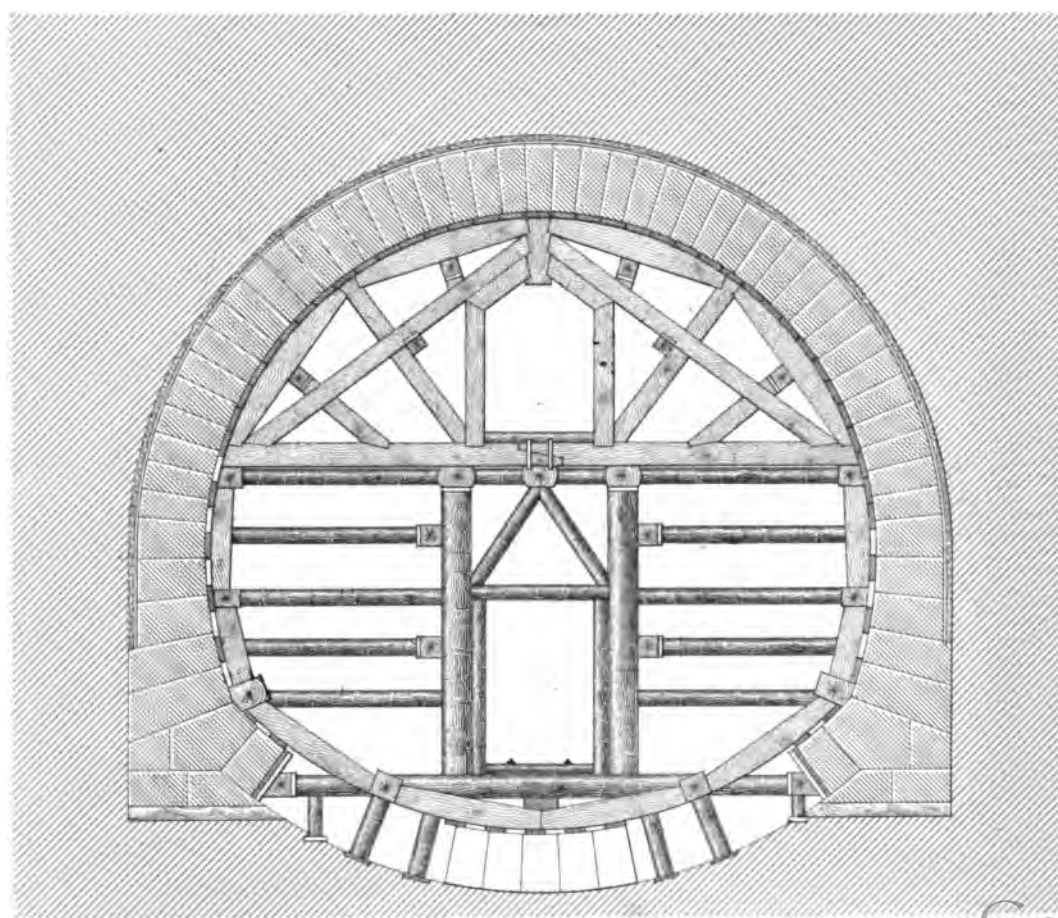


Fig. 2. Cintrage et construction de la voute.

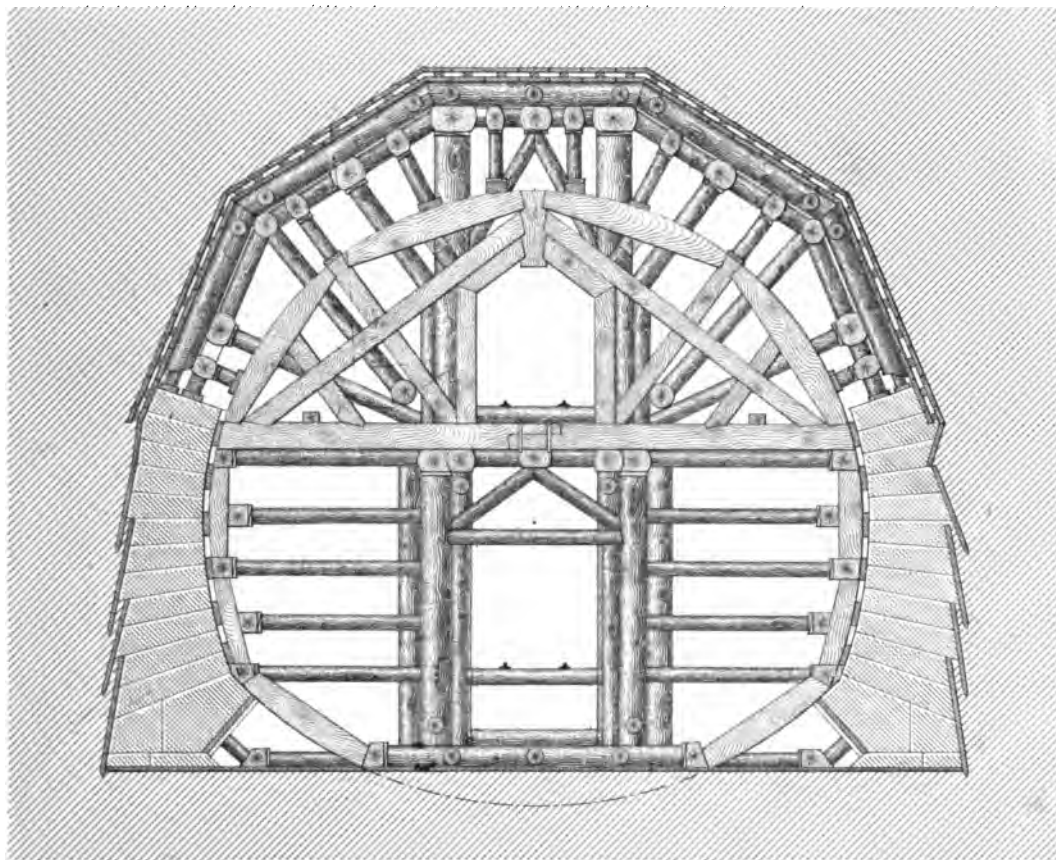


Fig. 4. Coupe longitudinale de l'avancement.

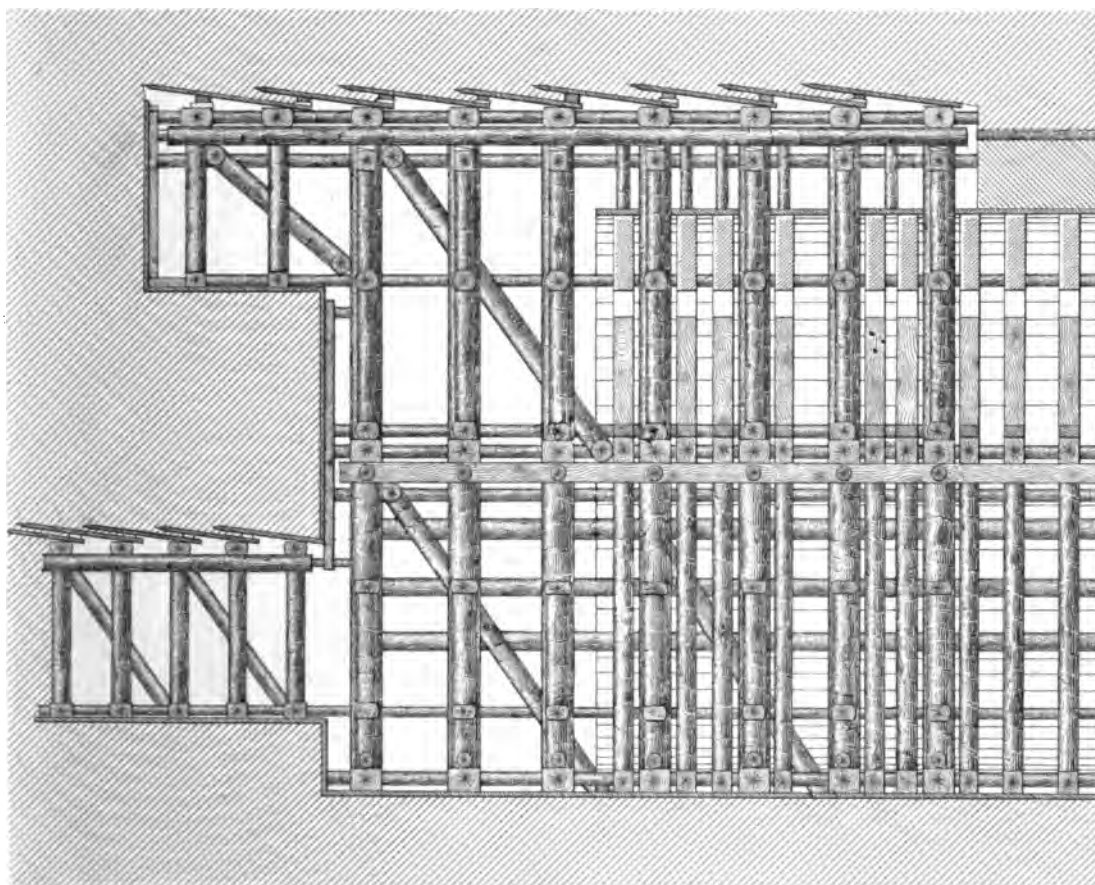
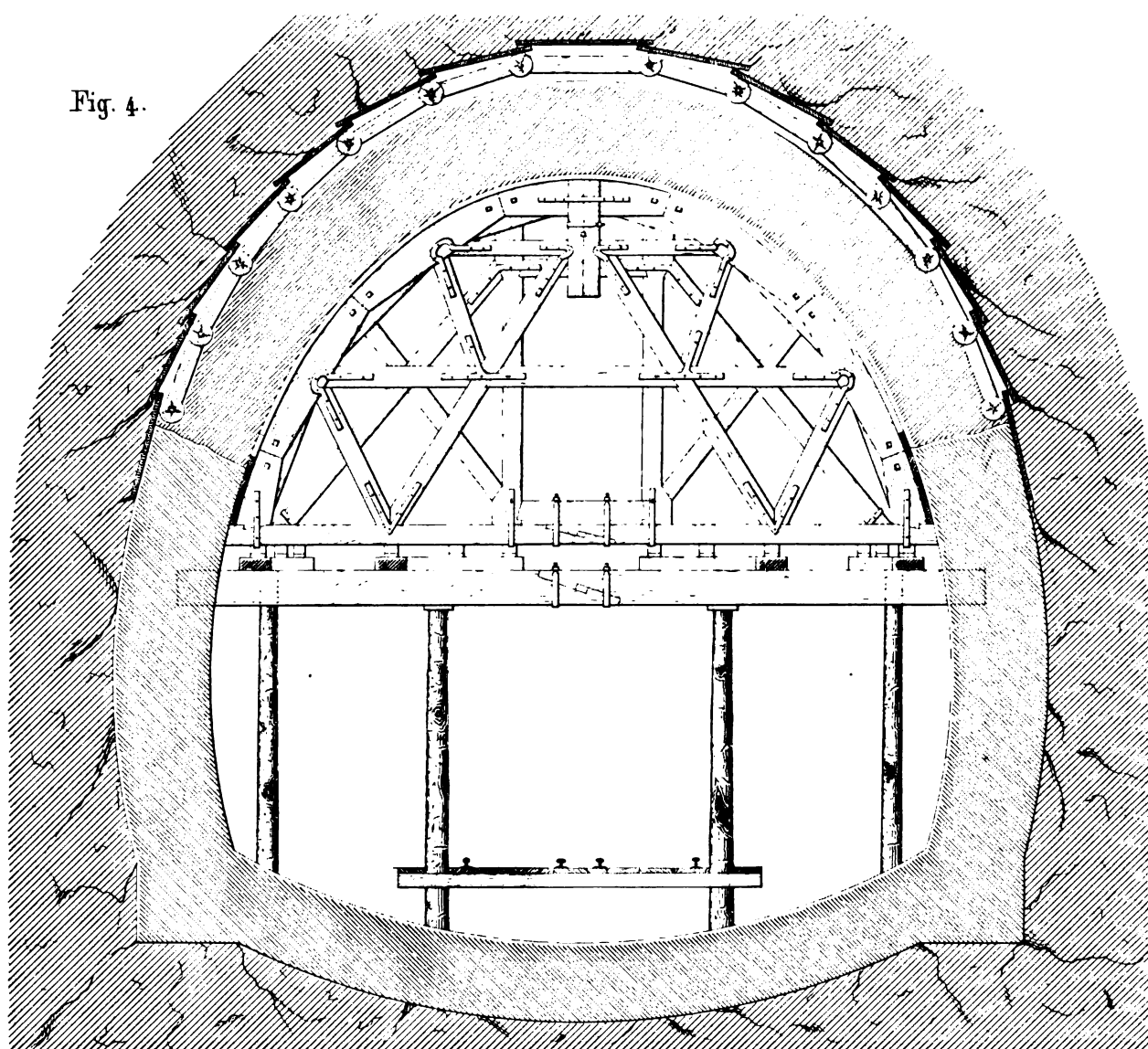


Fig. 4.



TUNNEL DE BLEKINGLEY.

Echelle: 1:100.

Fig.

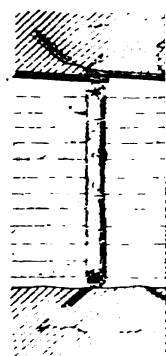
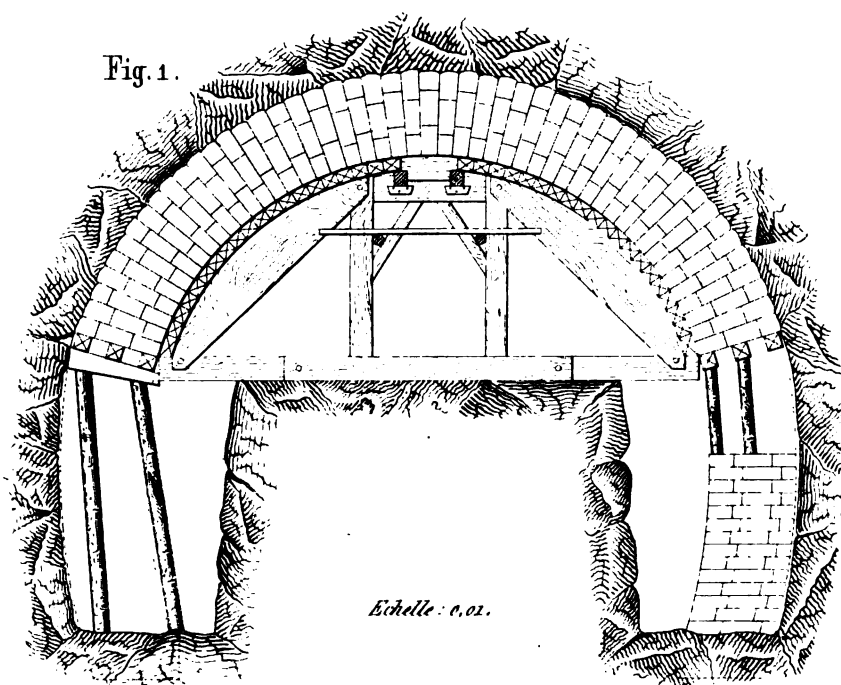


Fig. 1.

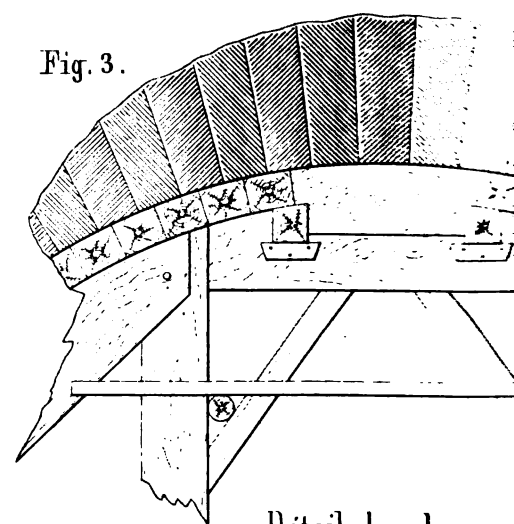


Echelle: 1:100.

Coupe transversale. Cintrage et muraillage.

TUNNEL DE SAINT CLOUD.

Fig. 3.



Détail du clavage

Echelle: 1:100.

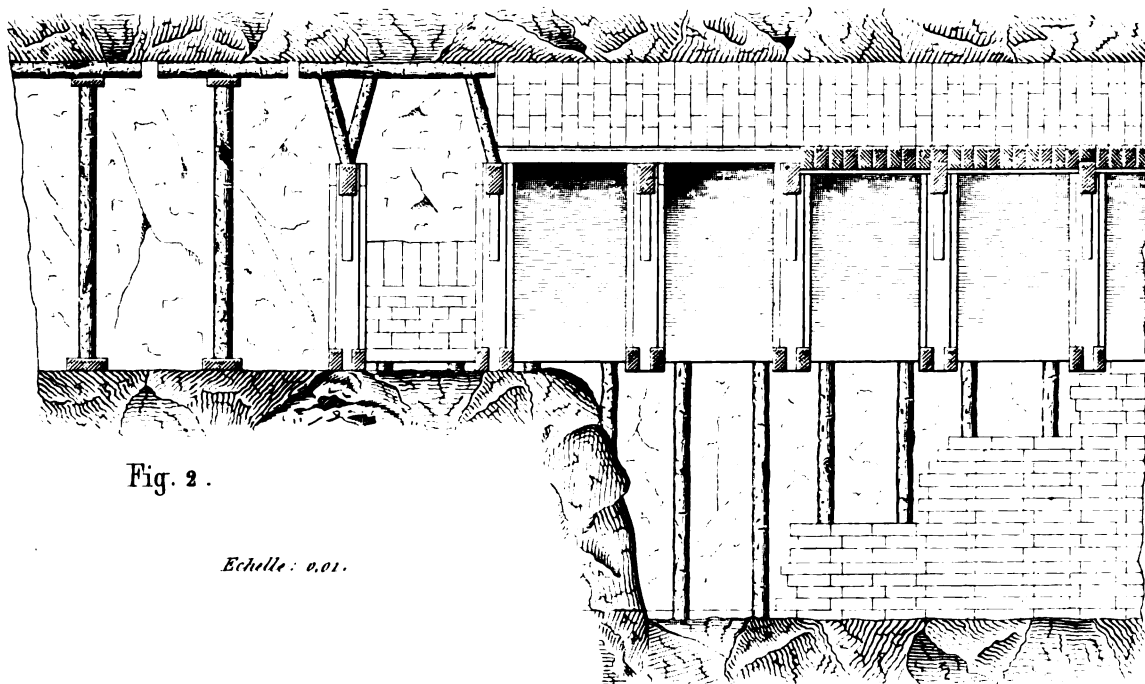
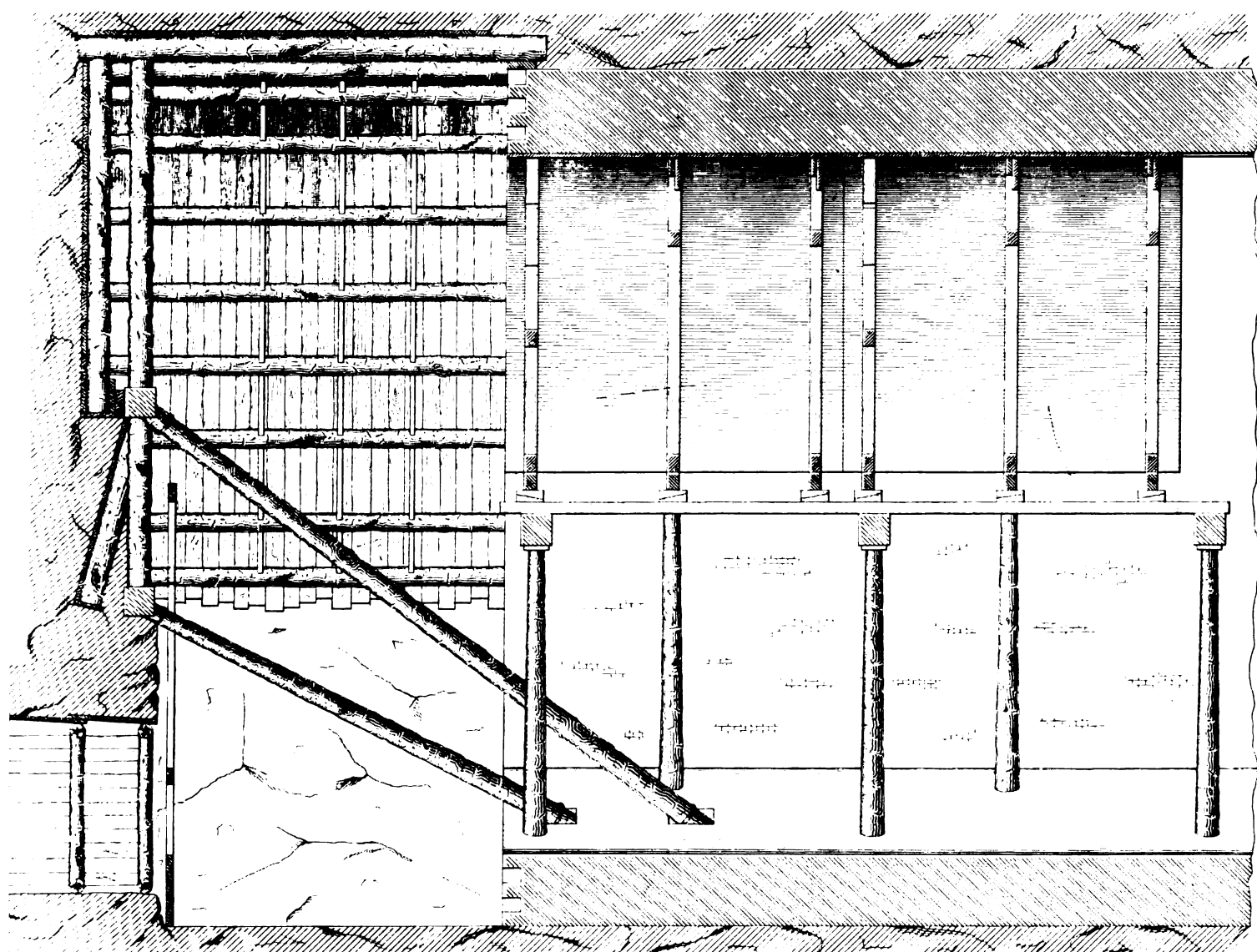


Fig. 2.

Echelle: 0.01.

Coupe longitudinale. Cimtrage et muraillement.

TUNNEL DE

Echelle

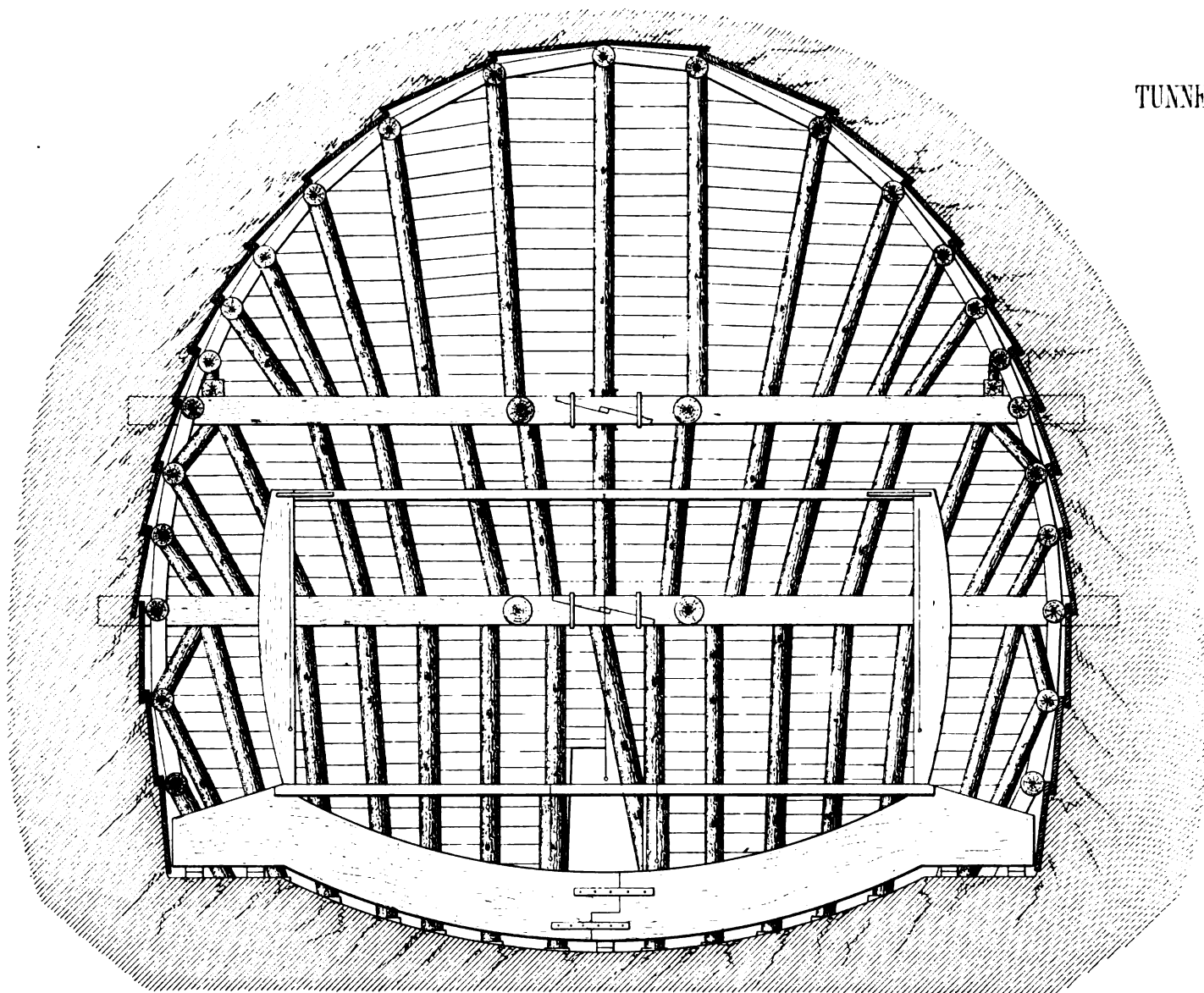


Fig 1. Boisage du front de taille.

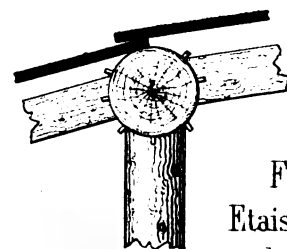
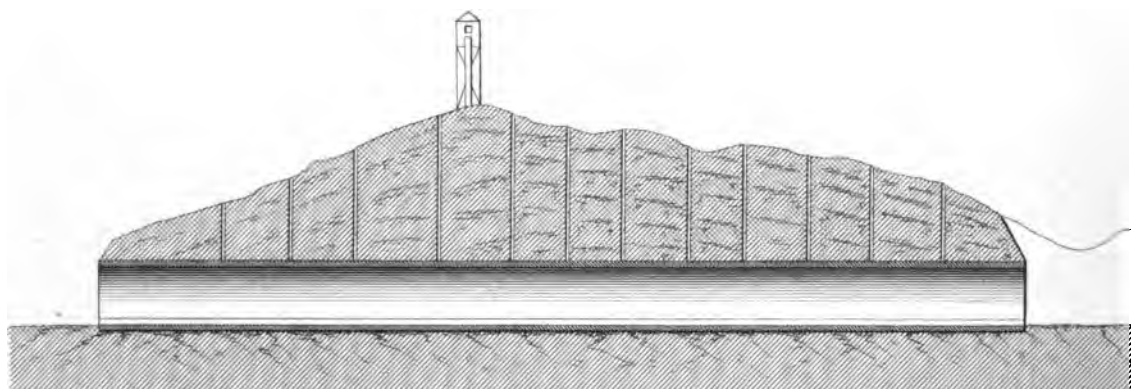
Fig. 3.
Etais du front
de boisage

Fig. 6. Coupe longitudinale du tunnel.

Echelle horizontale: 1000 — Echelle verticale: 1000.

BLECKINGLEY.

et 15.

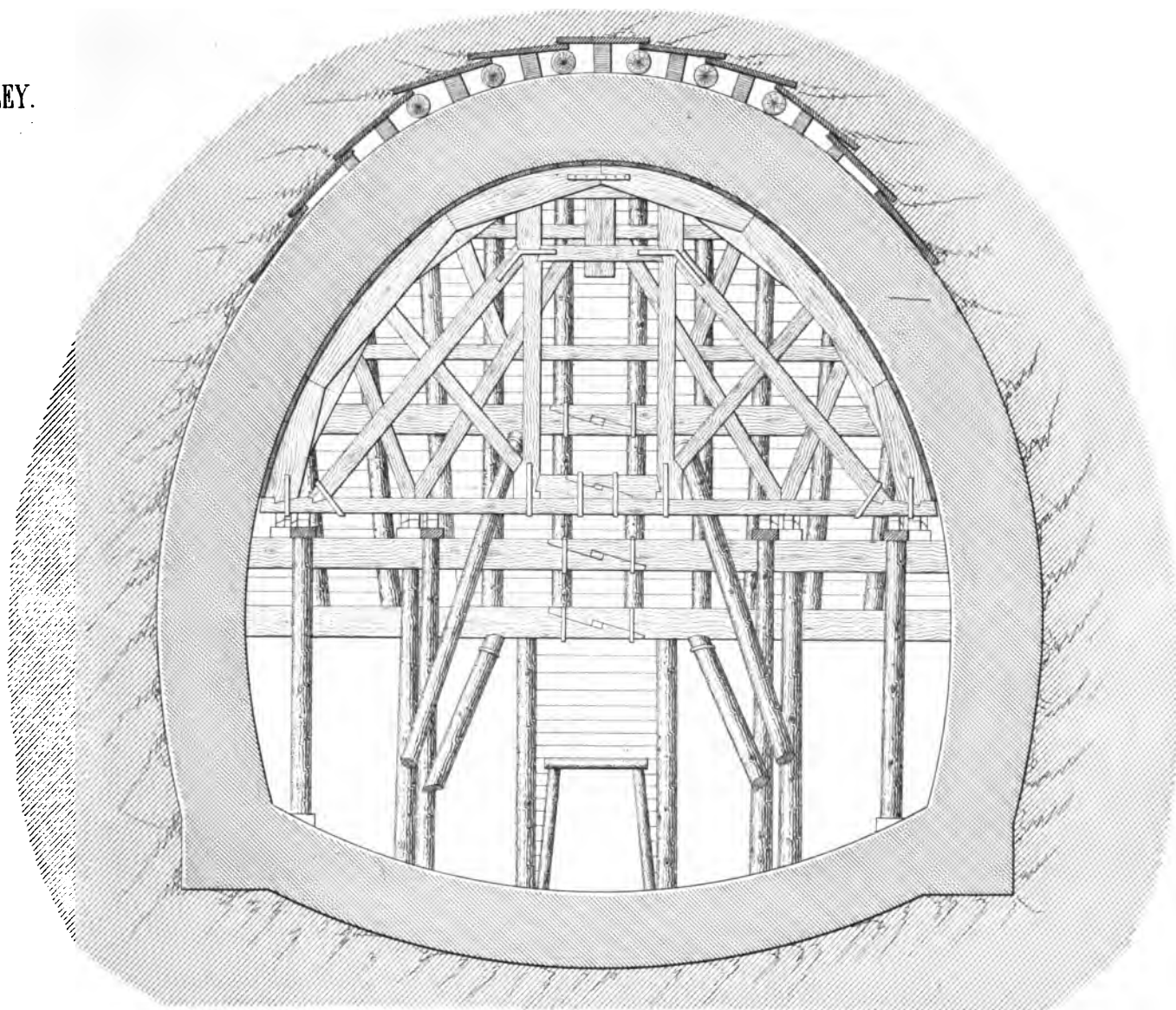


Fig. 2. Cintrage et muraillement.

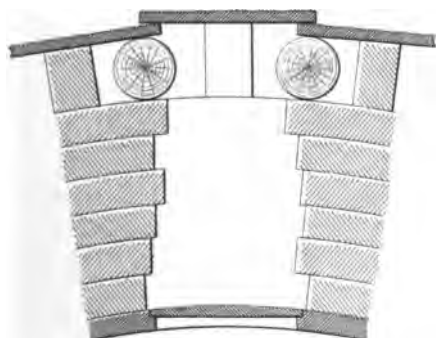
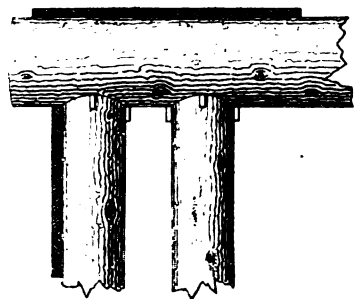


Fig. 5. Clavage de la voute.

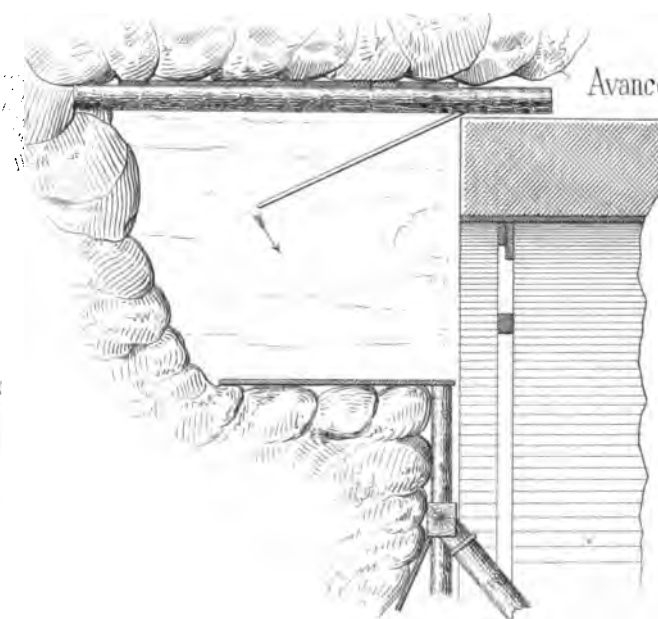


Fig. 4.
Avancement du gradin
supérieur.

Fig. 1.
Cintre
et
voussoirs

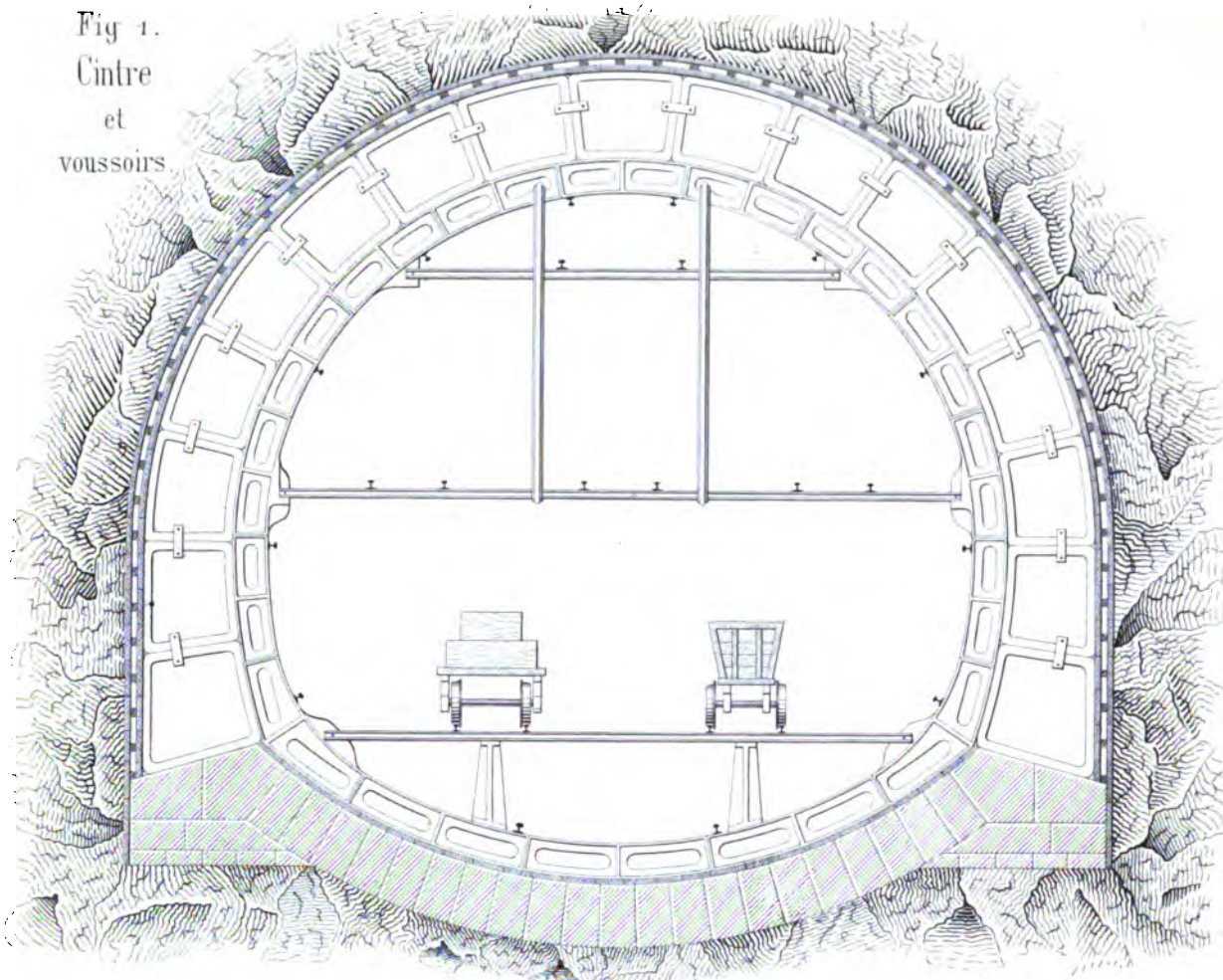


Fig. 2.
Muraillement

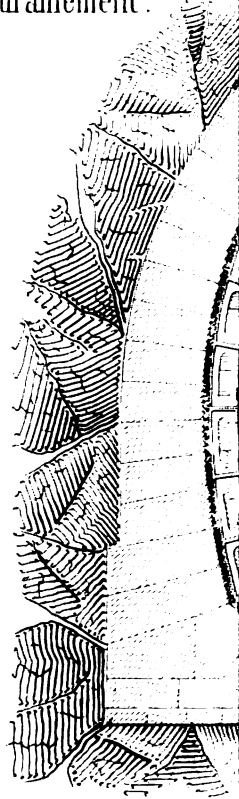
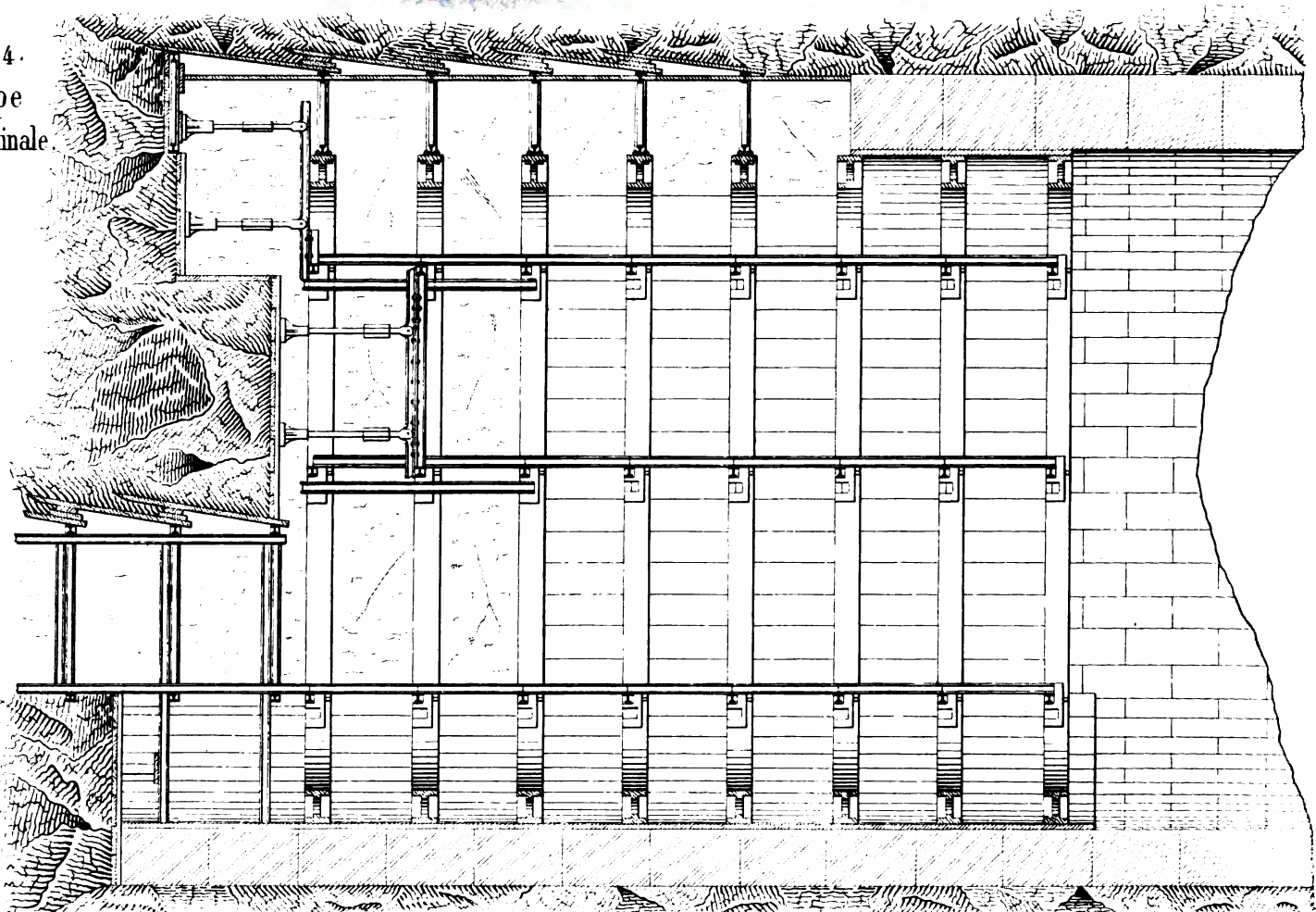


Fig. 4.
Coupe
longitudinale



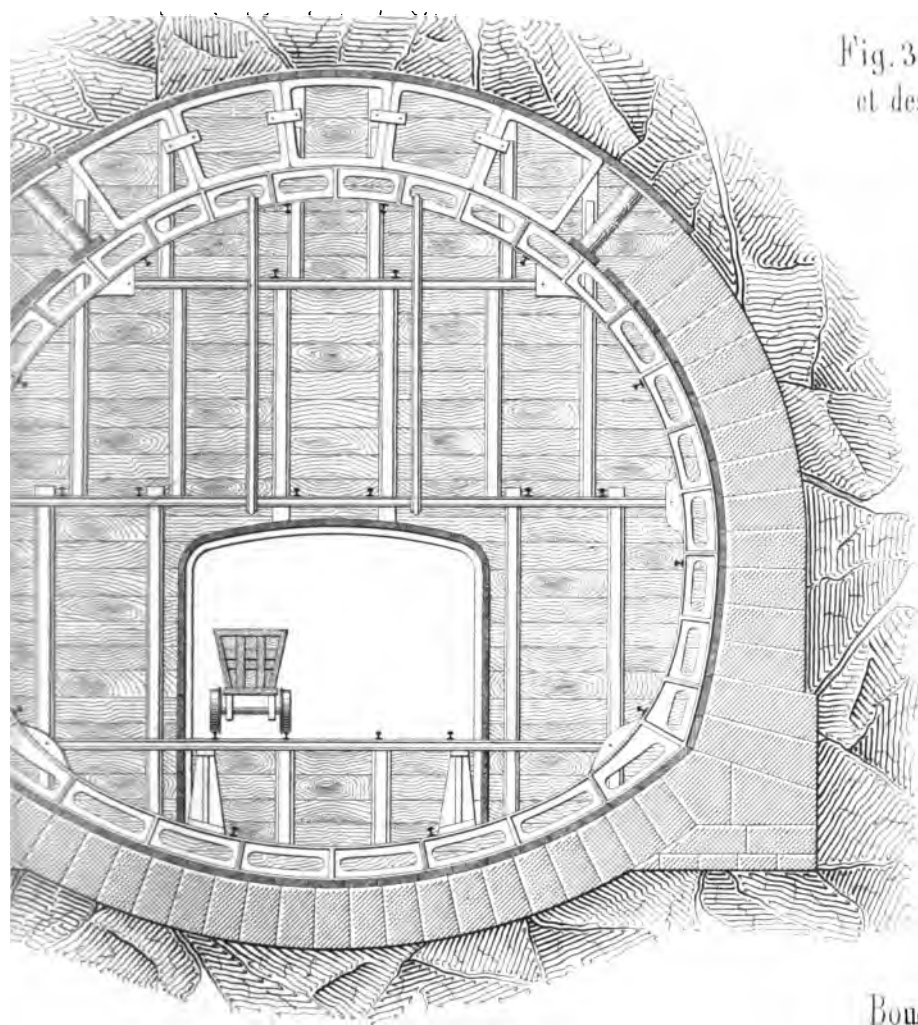


Fig. 5. Détail du bouclier

Fig. 3. Détails du cintre
et des voussoirs.

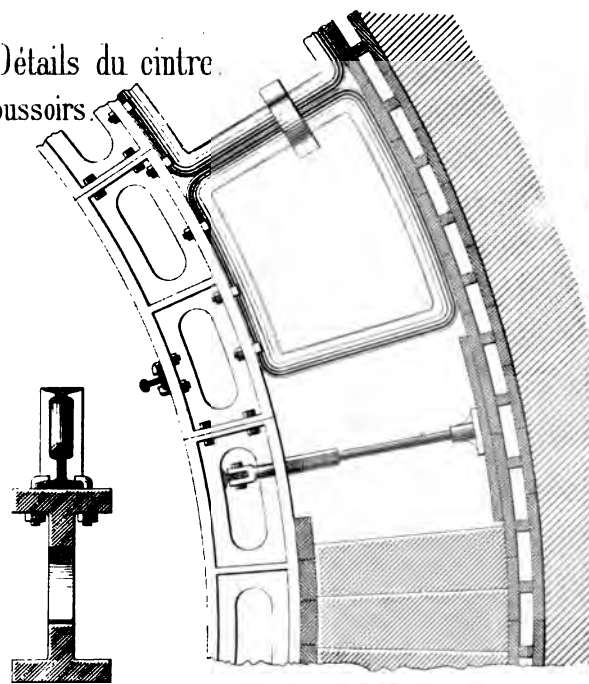
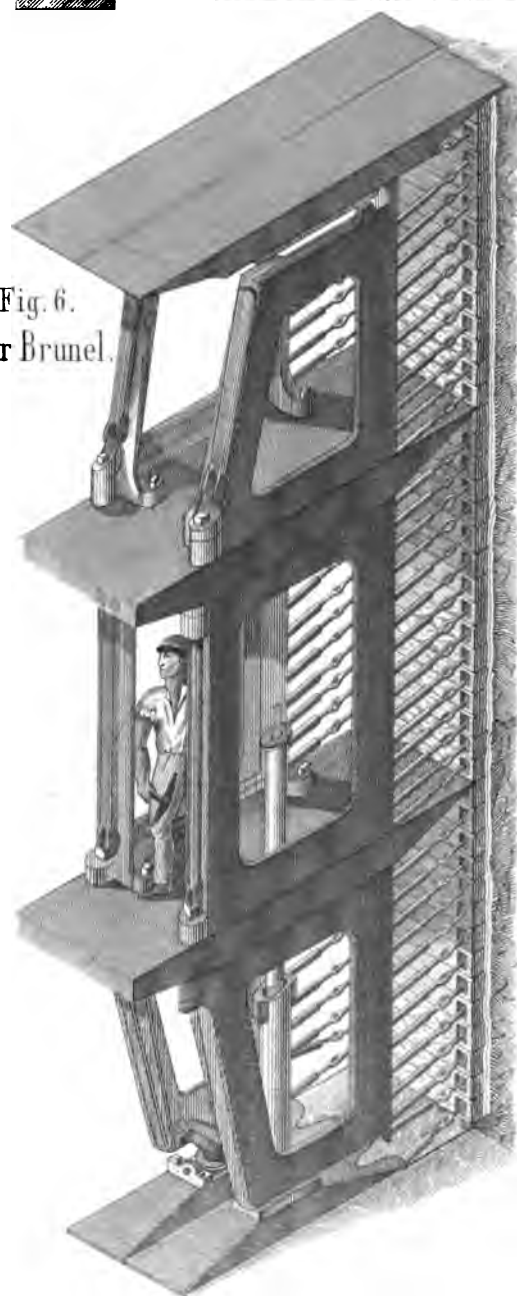


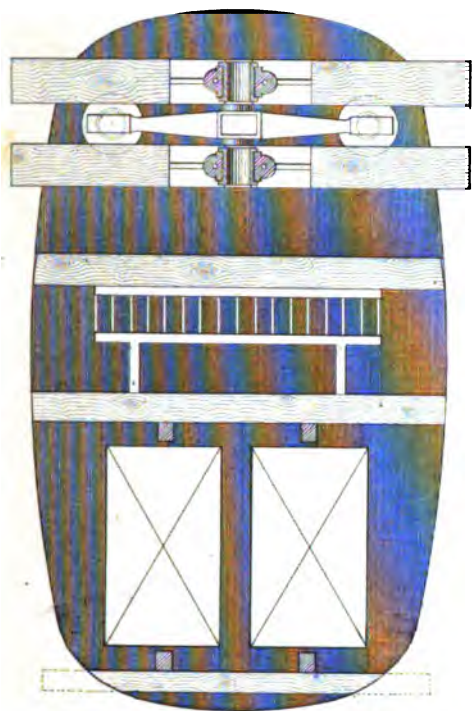
Fig. 6.
Bouclier Brunel.



NORD DE CHARLEROY.

FOSSE N° 4.

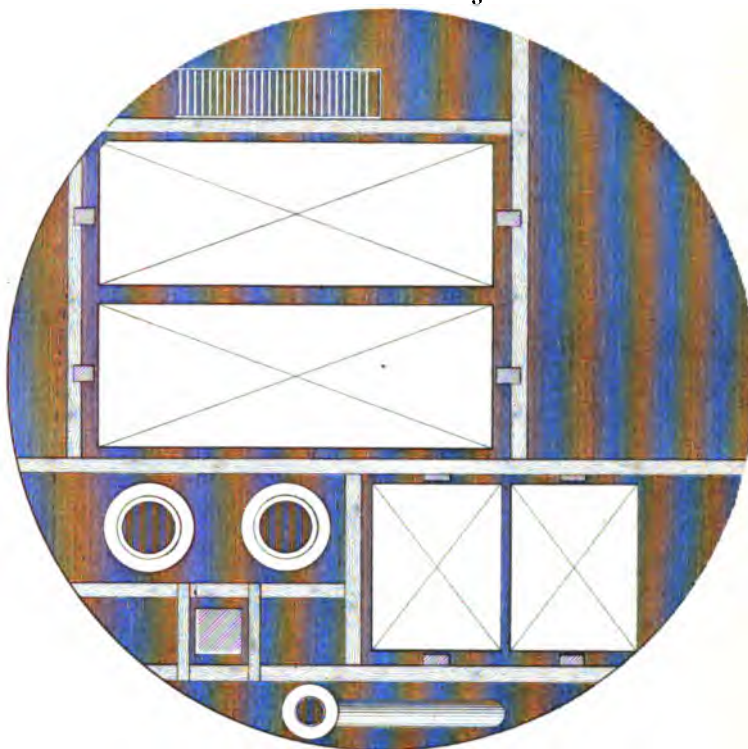
Exhaure, échelles, extraction.



RHEIN ELBE. RUHR.

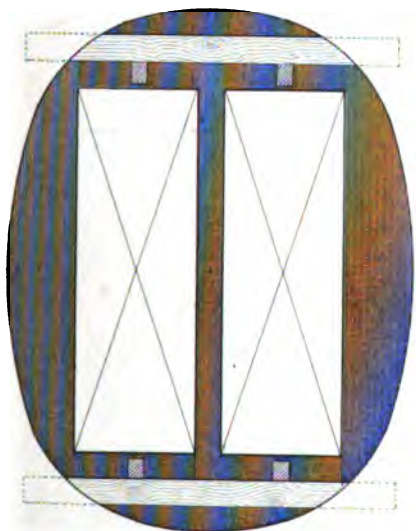
FOSSE DE 5 MÈTRES. (ALMA.)

Extraction, exhaure, aérage, échelles.



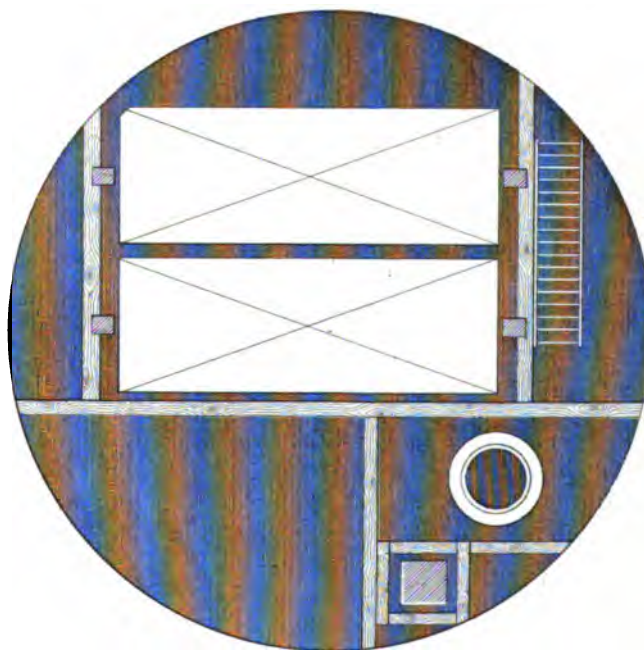
NORD DE CHARLEROY.

FOSSE D'EXTRACTION, N° 4.



RHEIN ELBE. RUHR.

FOSSE DE 4 M. 30.



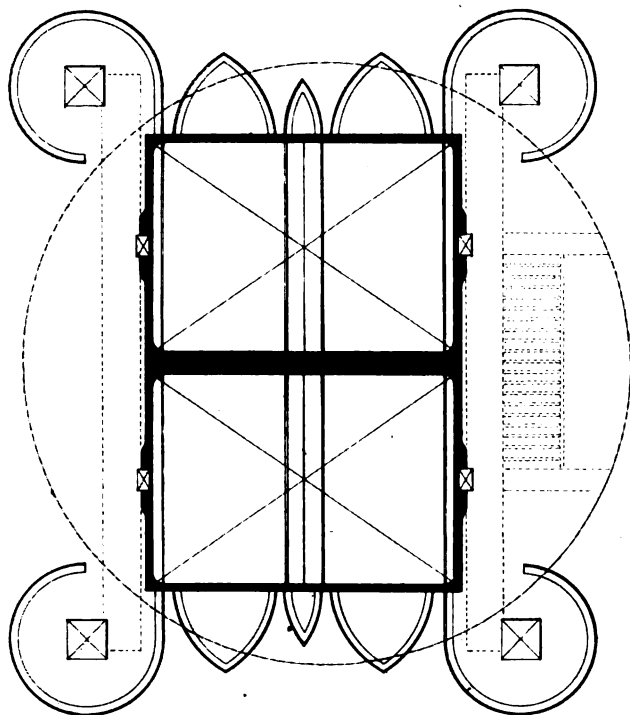
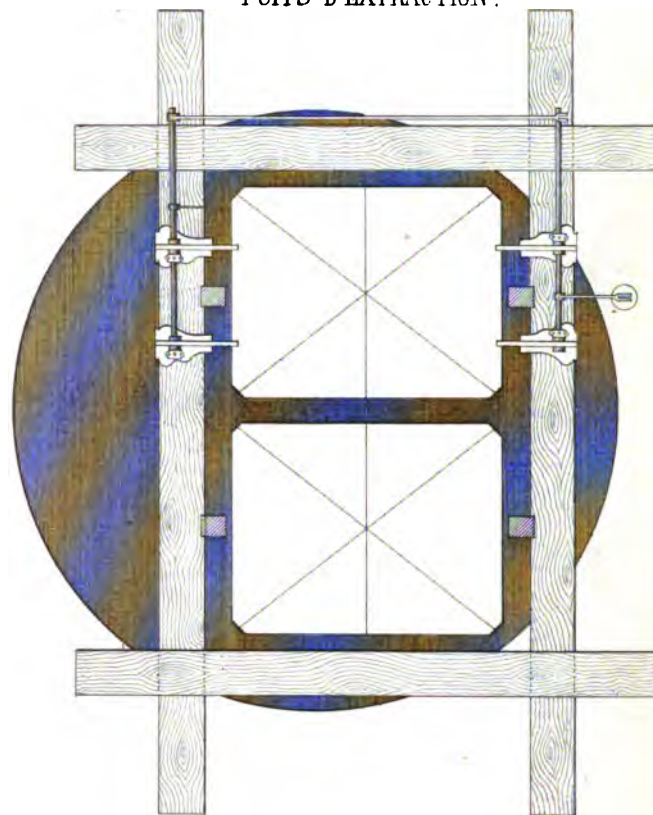
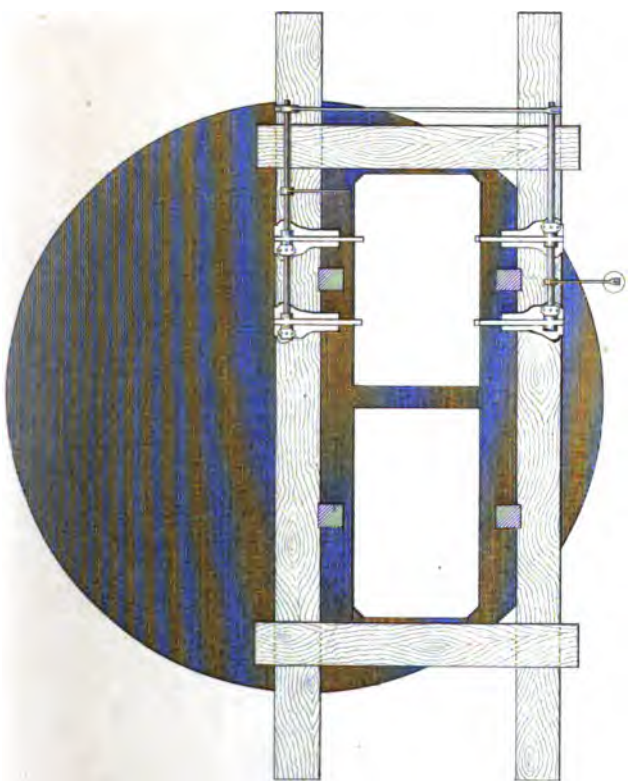
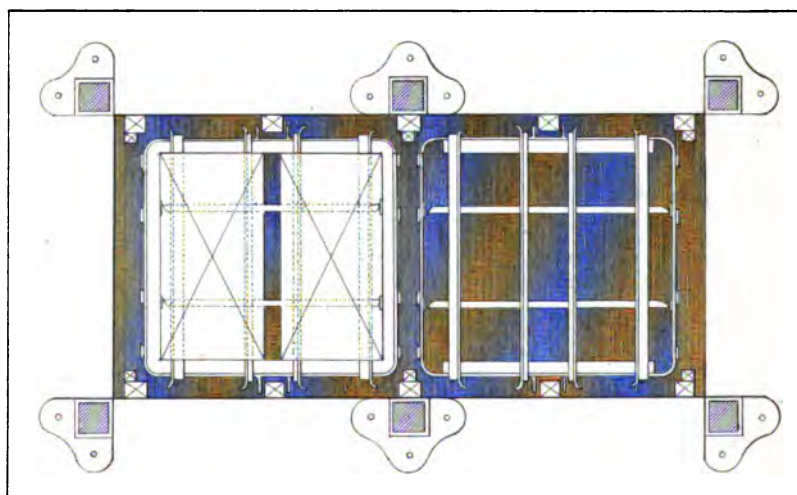
PUITS D'EXTRACTION
DU MAGNY.FOSSE D'HAVELUY.
PUITS D'EXTRACTION.FOSSE D'HAVELUY.
PUITS D'AÉRAGE.FOSSE DES VALLÉES
A GILLY-CHARLEROY

Fig. 1. Boisage d'un puits rectangulaire.

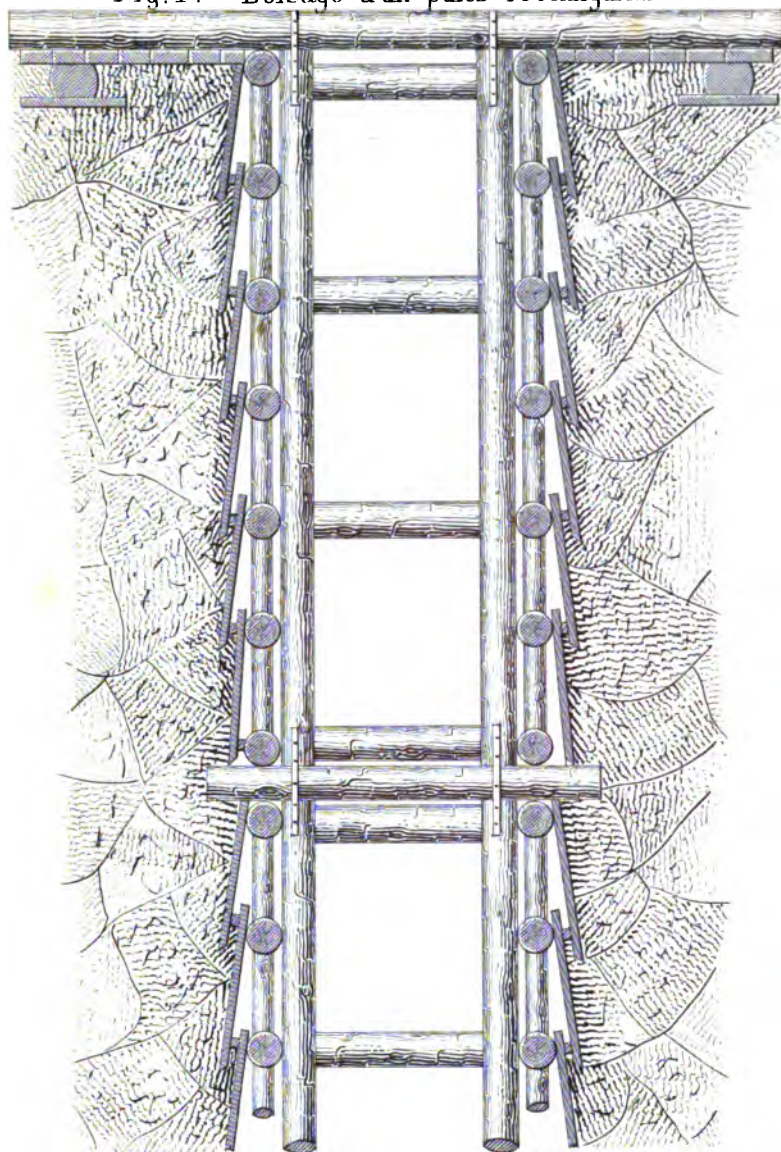


Fig. 2. Boisage d'un puits rectangulaire.

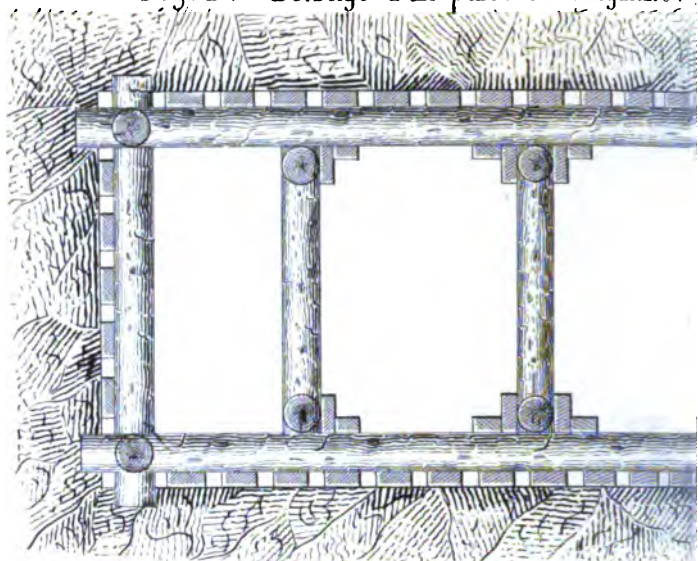


Fig. 4.

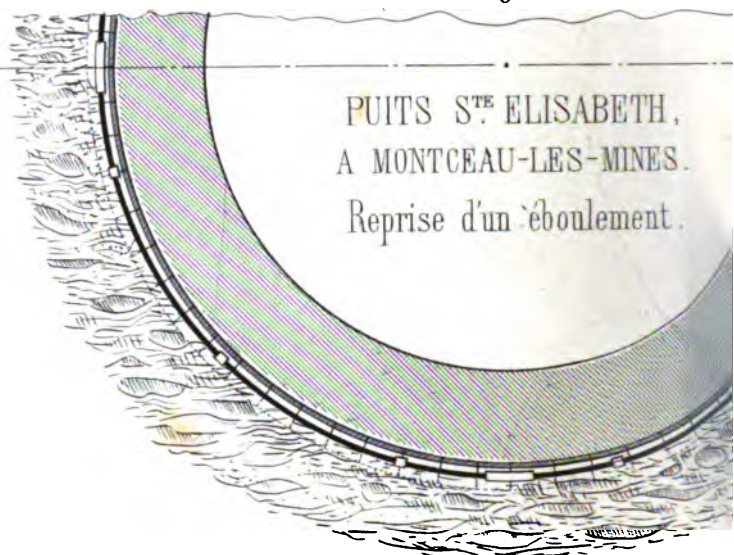
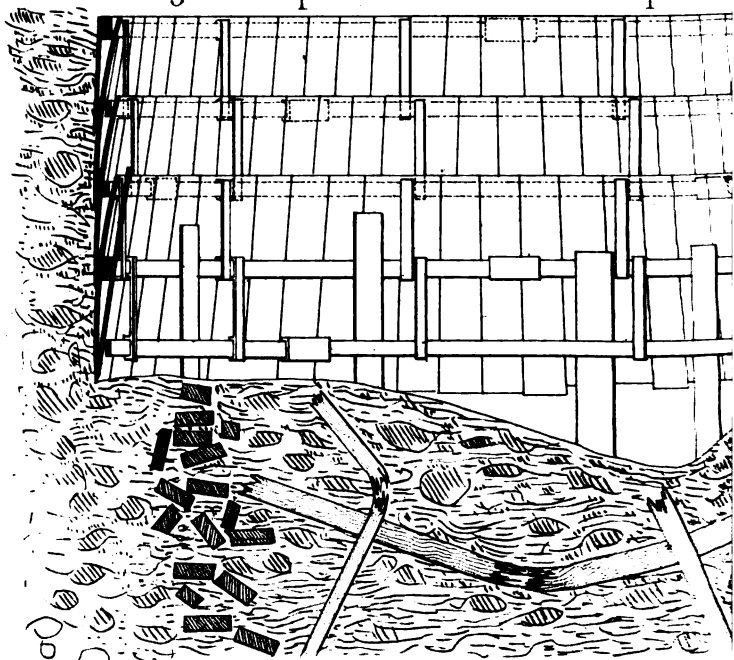


Fig. 3.

Fonçage d'une avaleresse.
Boisage provisoire.

Fig. 5. Reprise d'un éboulement au puits S^{TE}

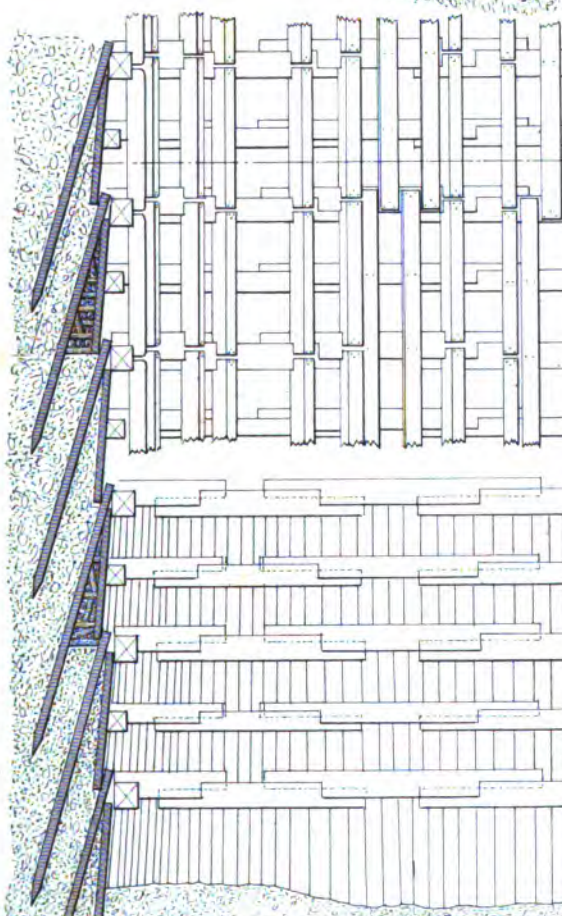
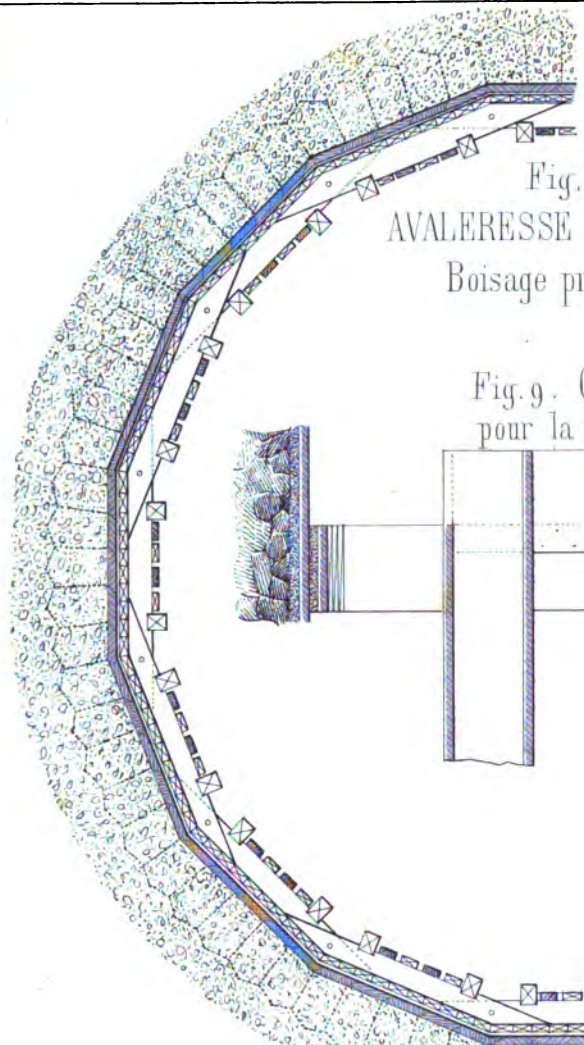
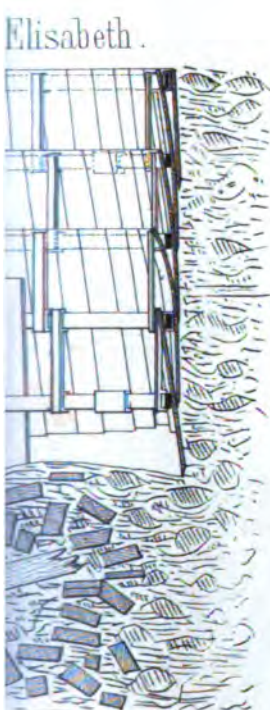
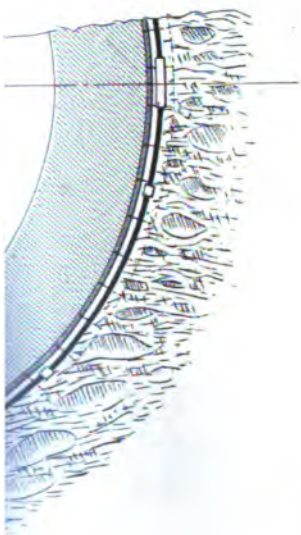


Fig. 6. AVALERESSE DE MARLES.
Coupe de la 3^{me} passe.

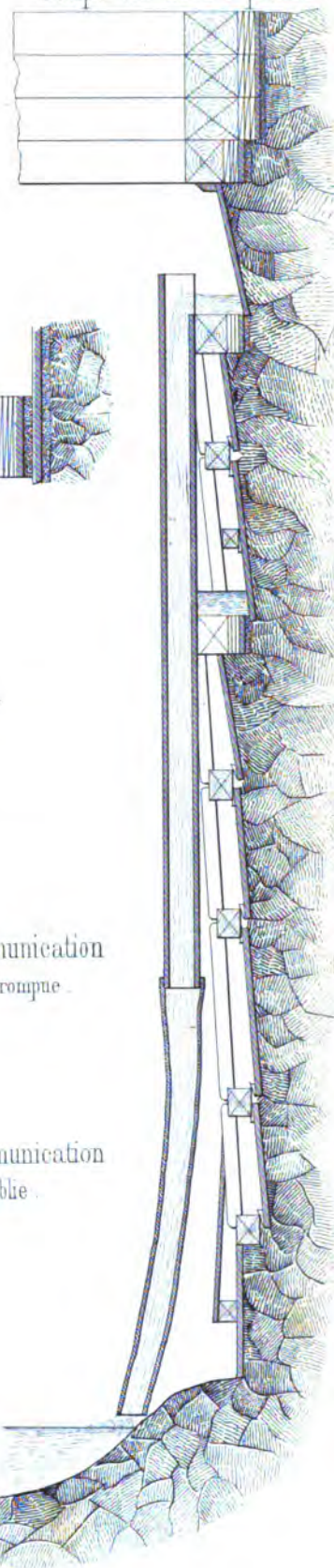
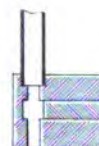


Fig. 10.
Renvoi de niveau.



Communication
interrompue.



Communication
établie.

Fig. 8.
Coupes du
Boisage provisoire.

Echelle. 1:25.

Boisages employés à l'avaleresse Joseph Perier.

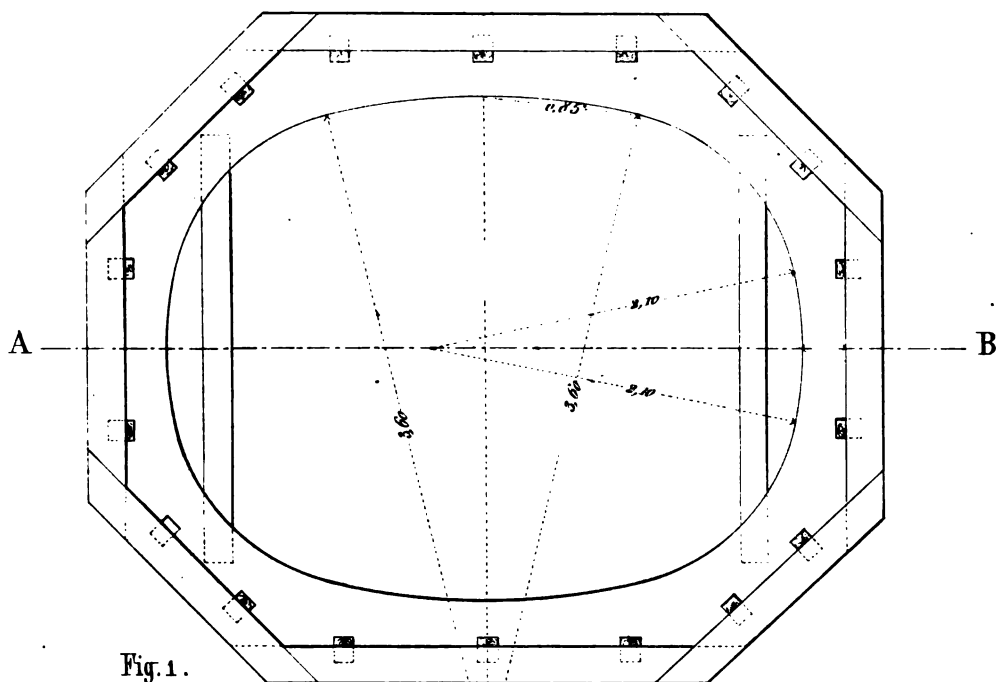


Fig. 1.

Coupe du boisage suivant A B.

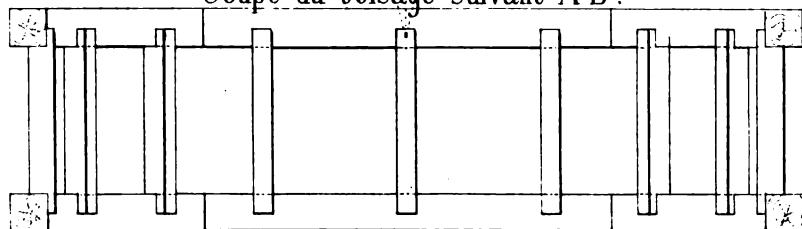


Fig. 2

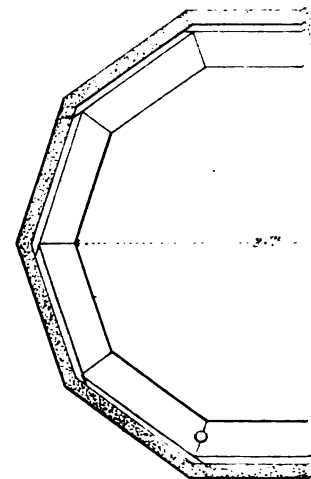
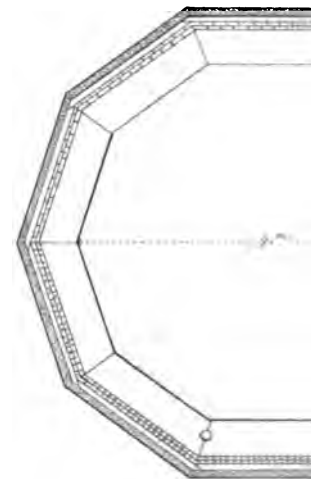
Coupe d'une trouss
le moussage et

Fig. 3

Picotage
les plats coins enfor

Picotage ten

Fig. 4.

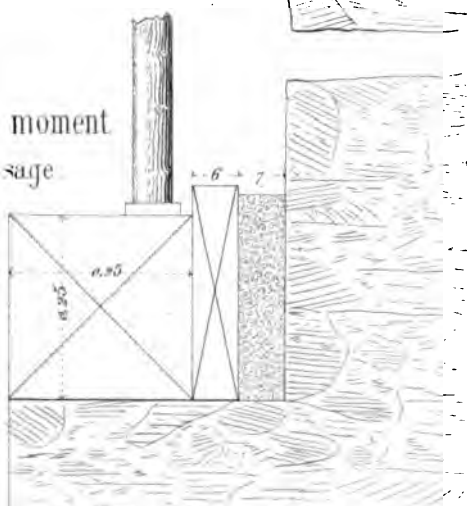
Trousse au moment
du moussage

Fig. 5.

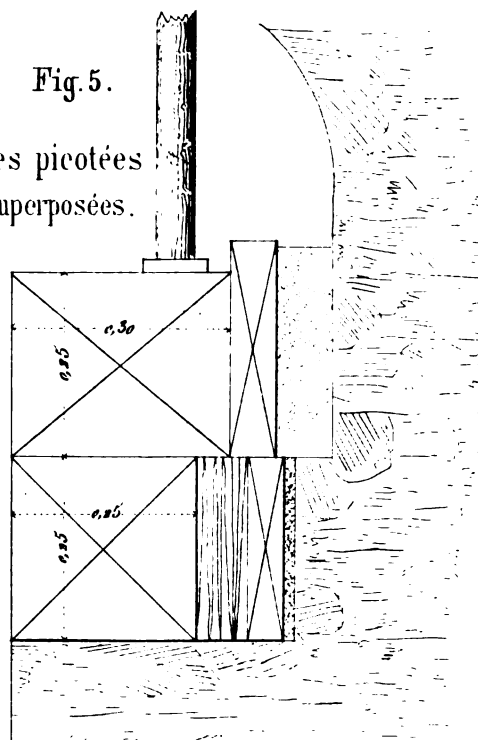
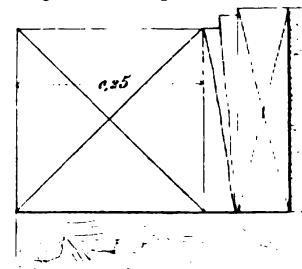
Trousse picotées
superposées.

Fig. 6.

Trousse au moment du
receppe des plats coins.

Puits cuvelé à 16 pans.
Disposition des trusses picotées.

Fig. 8.

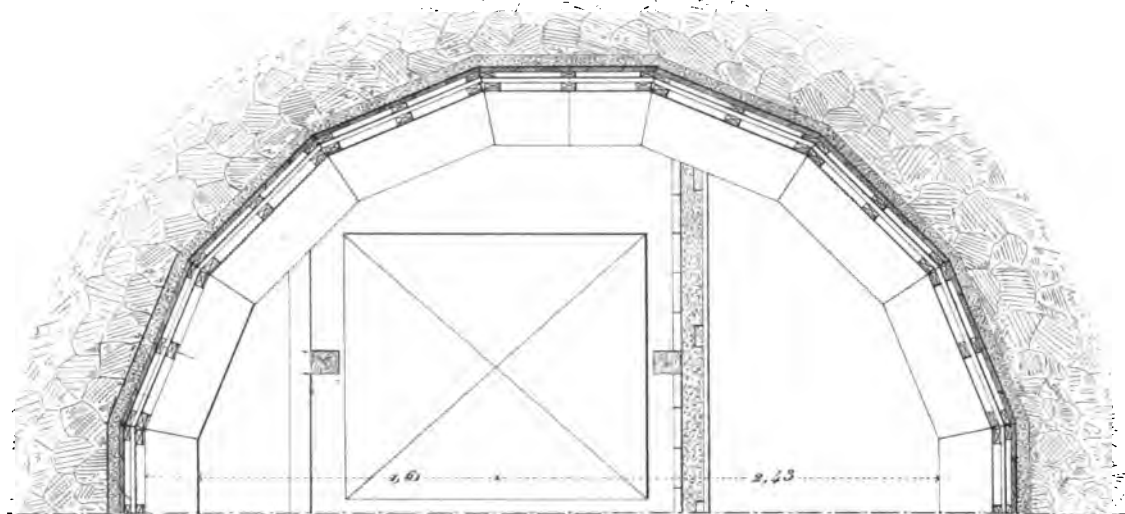


Fig. 9. Disposition des compartiments d'extraction et d'aérage.

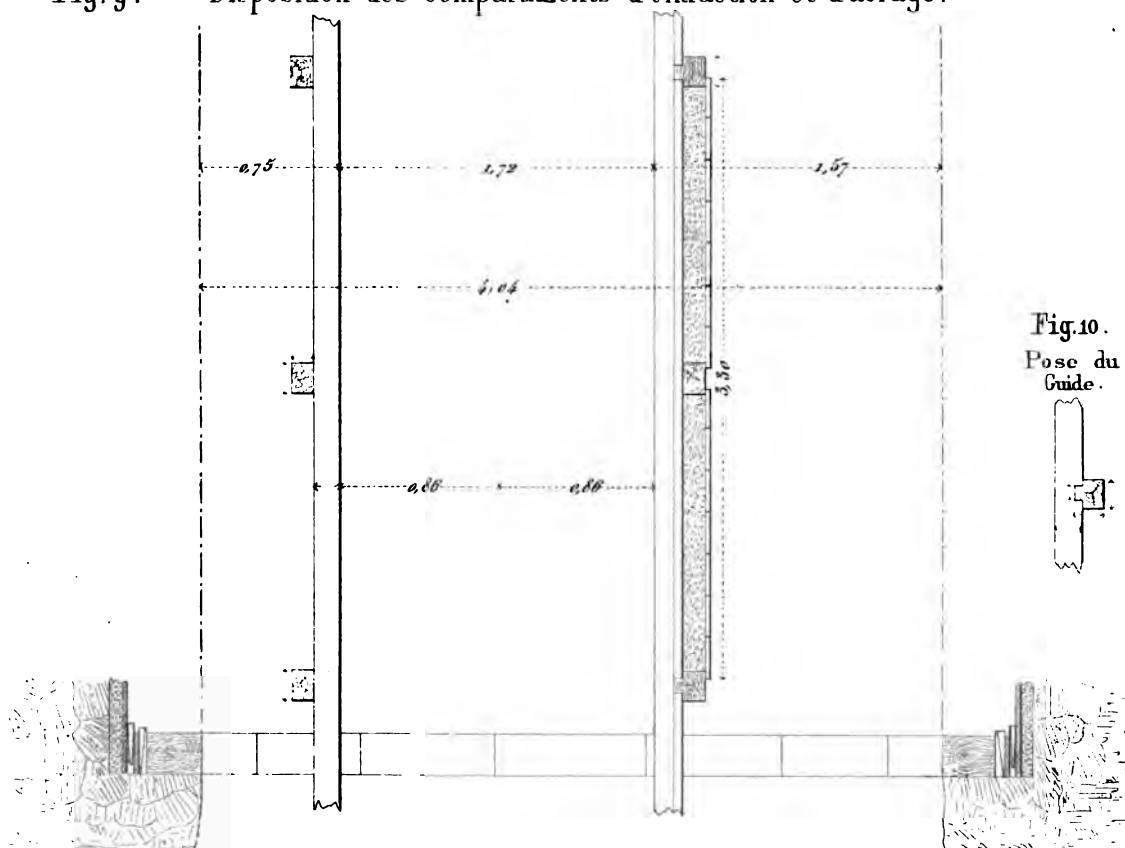


Fig. 10.
Pose du Guide.



Fig. 7.
Trousse picotée
recepape de la lambourde

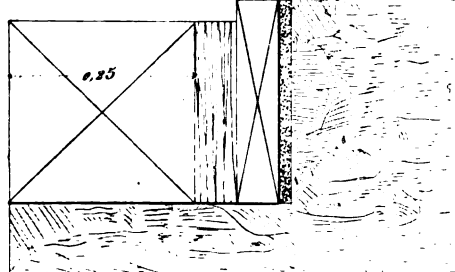
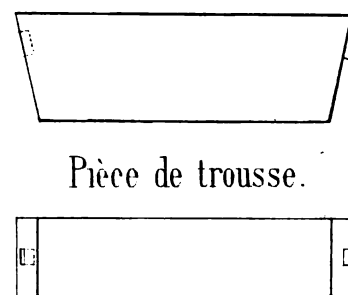


Fig. 11.



Pièce de trousse.

Fig. 1.

Coupe du muraillement

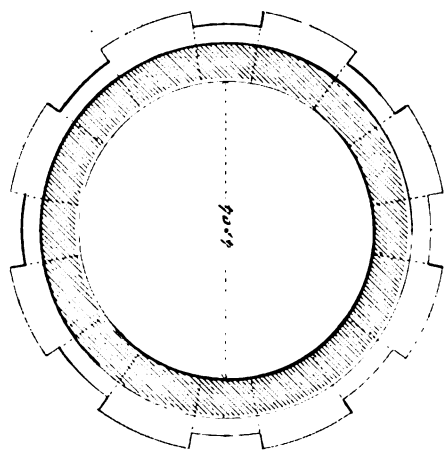


Fig. 2. 1^{re} Section

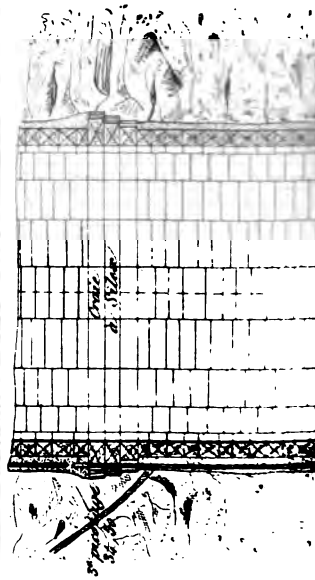
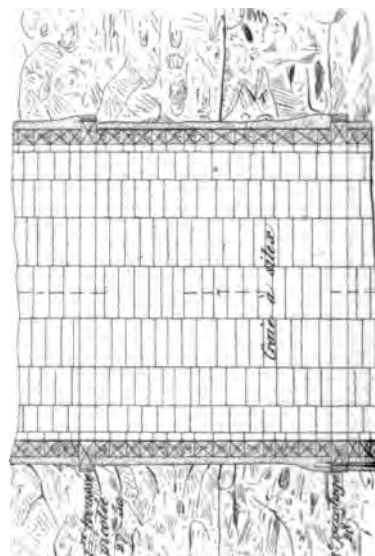


Fig. 6. Trouse picotées de la base.

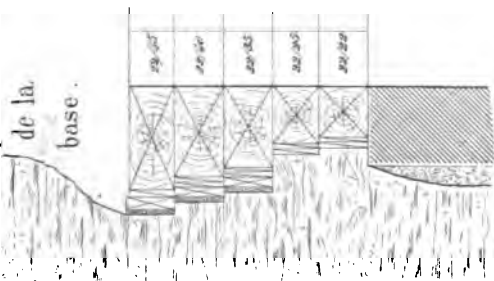


Fig. 7.

Renvoi de niveau.

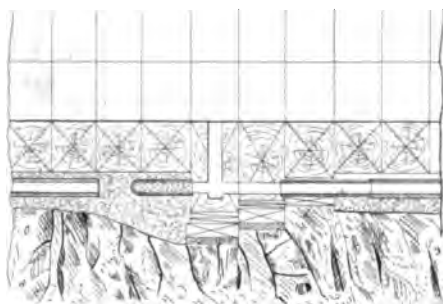


Fig 5.
Détail du
cuvelage.

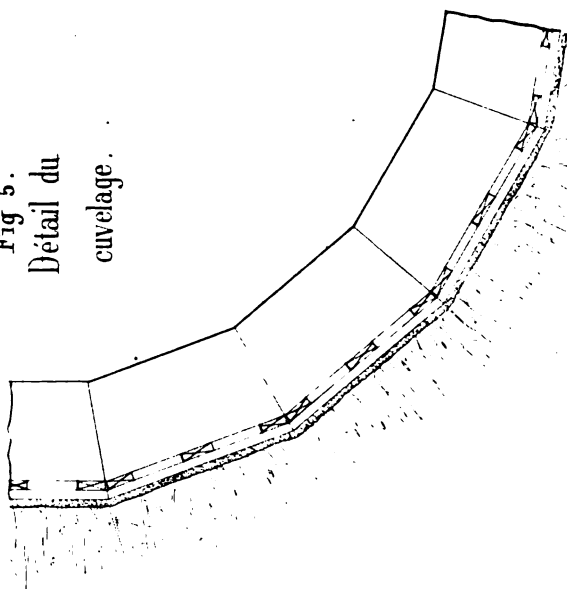


Fig. 3. 2^e Section

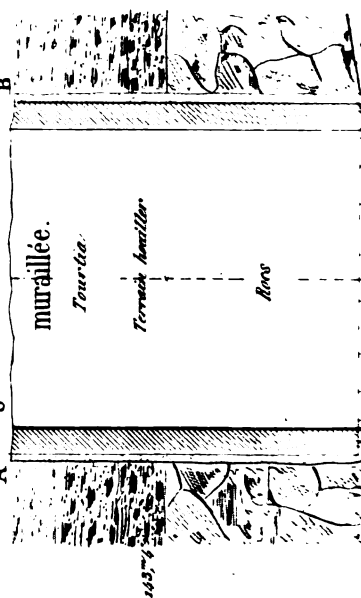
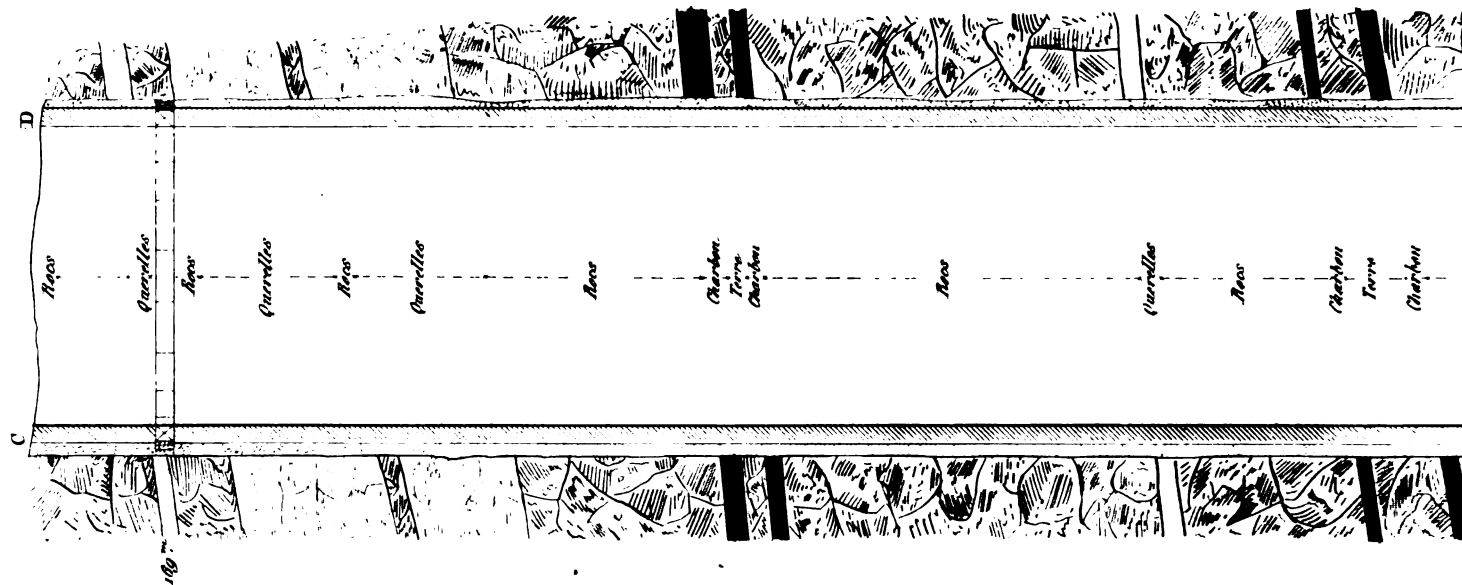
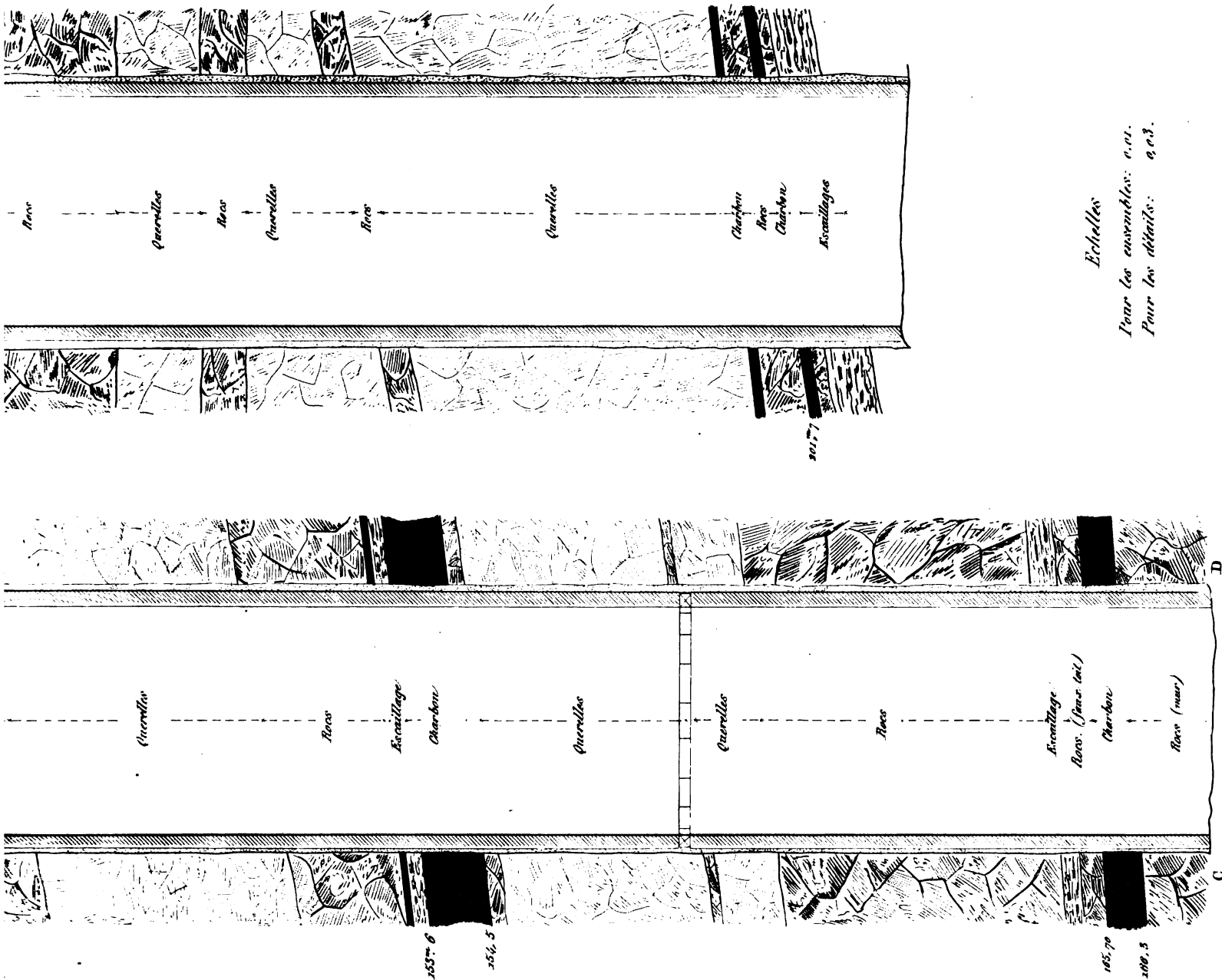
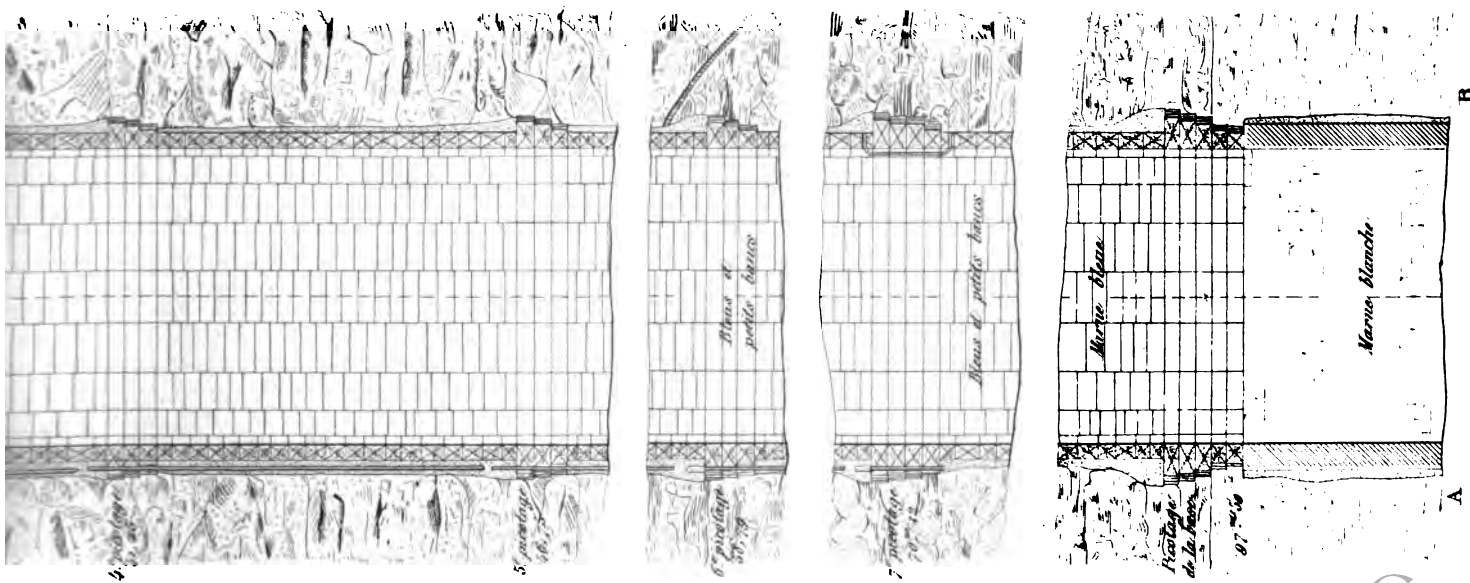


Fig. 4.



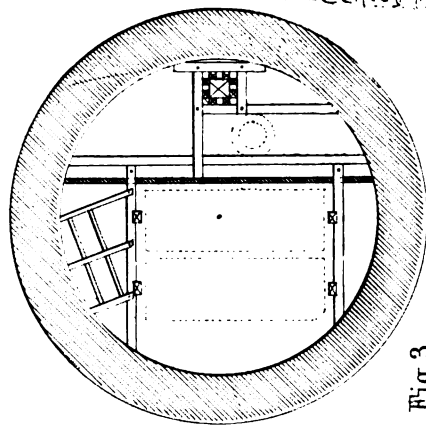


Echelles

Pour les ensembles: 0.01.

Pour les détails: 0.03.

Fig. 1.
Section du puits.



Echelles { pour les ensembles: 0, 01.
pour les détails: 0, 03.

Fig. 2.
Coupe du cuvelage.

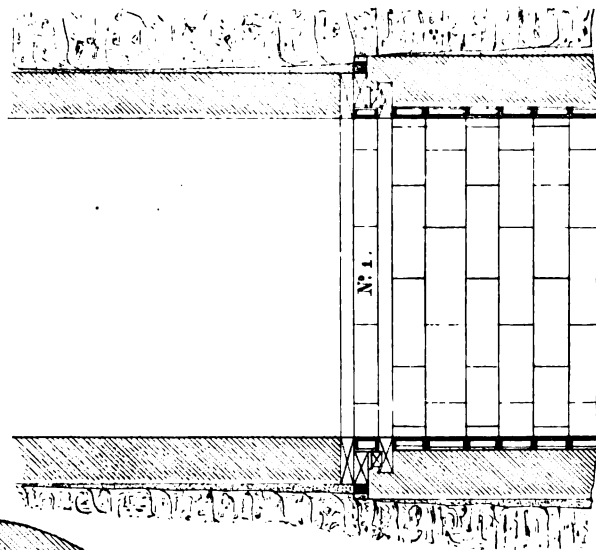


Fig. 3.
Détails des trusses.

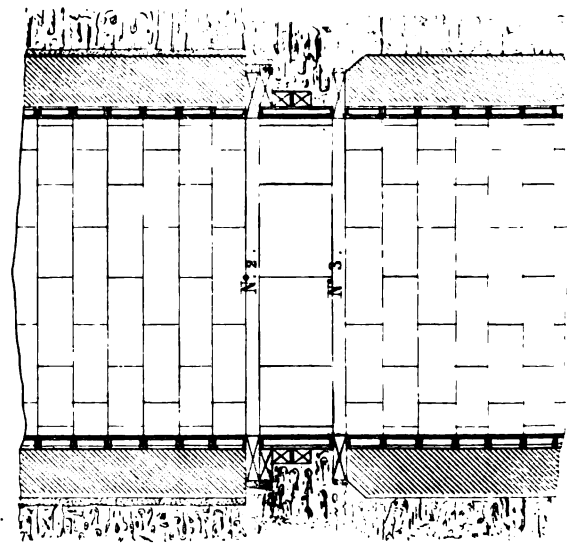
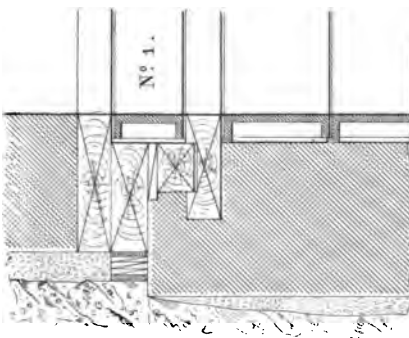
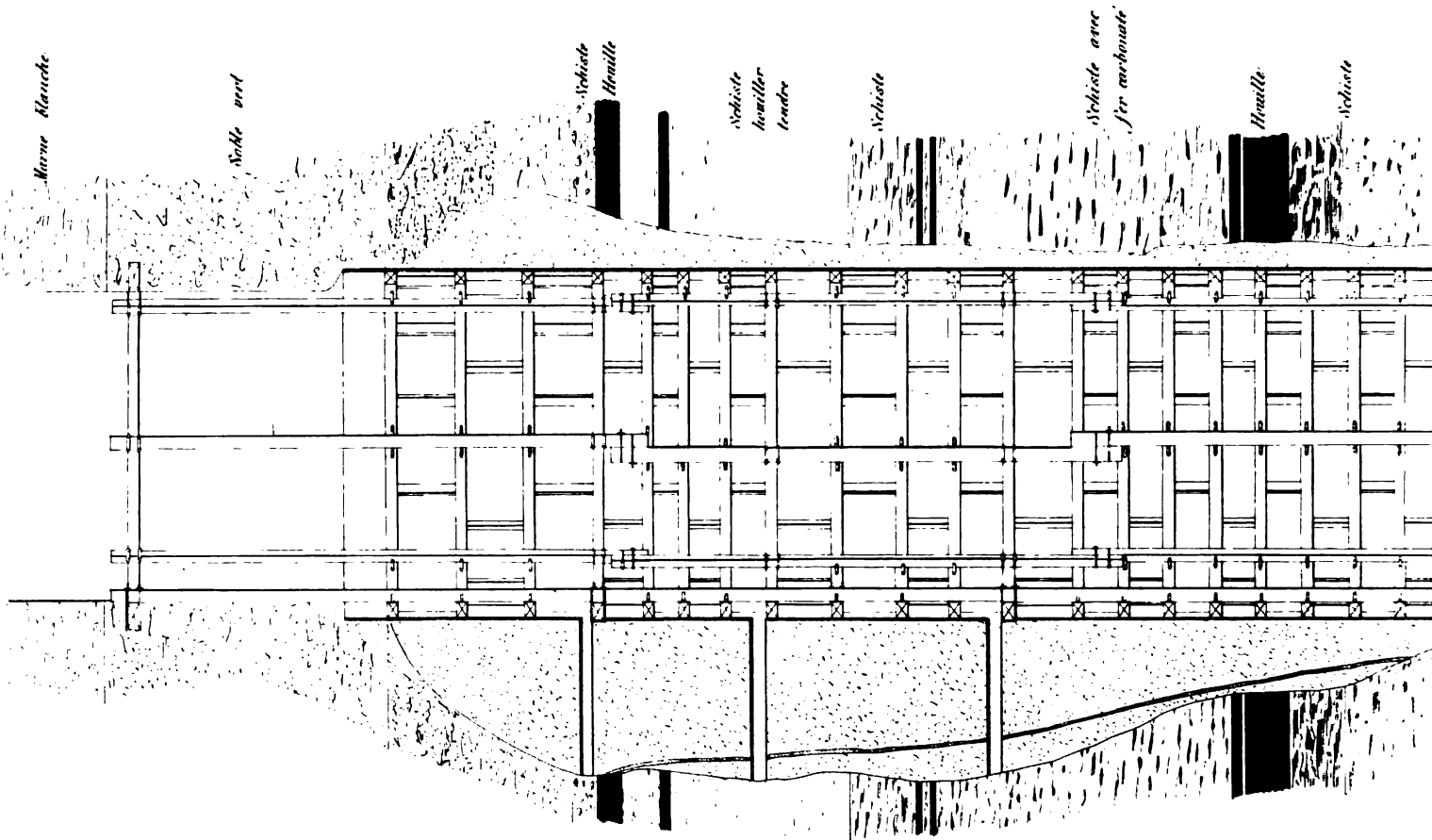


Fig. 4. Coupe de l'éboulement.



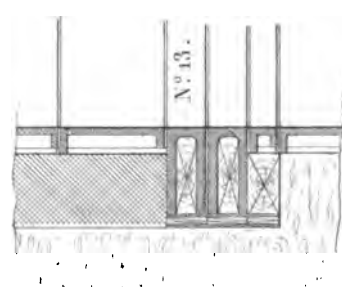
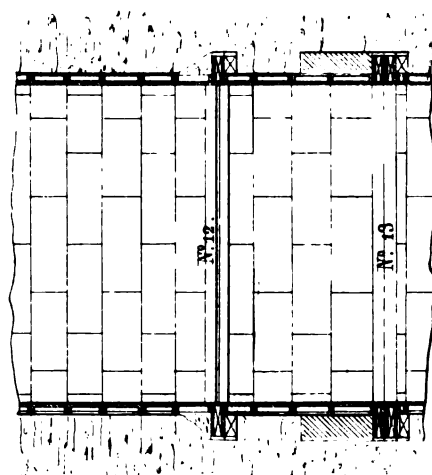
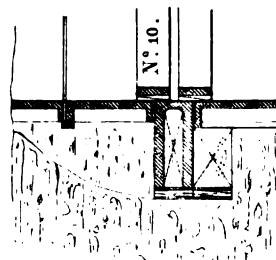
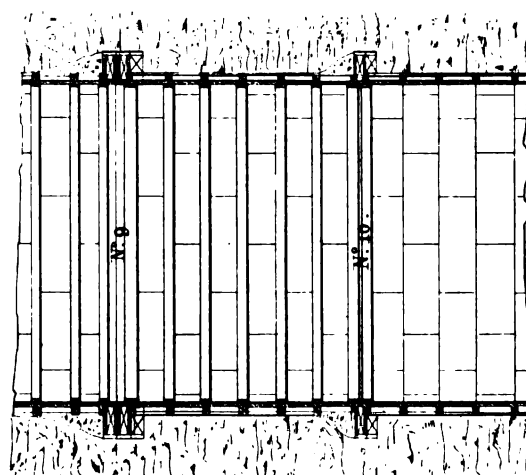
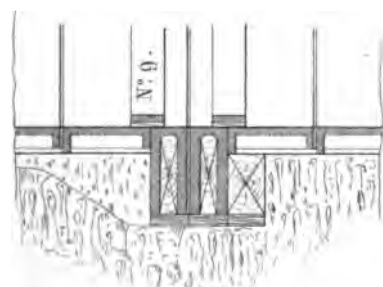
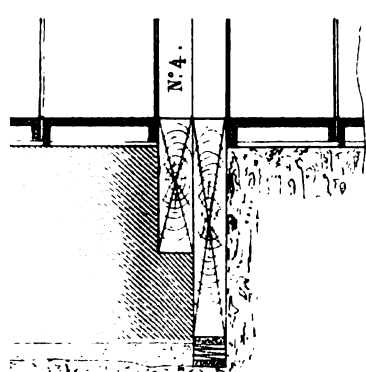
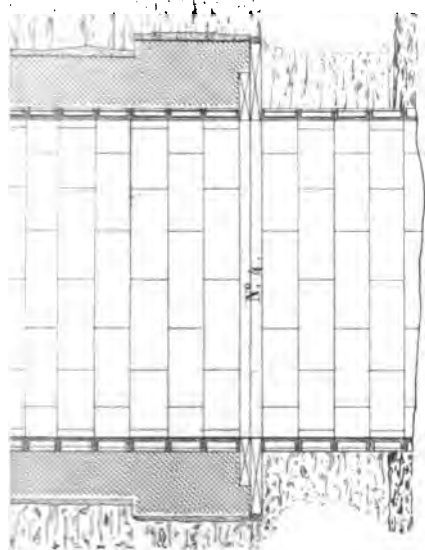


Fig. 5.

Coupe de la pompe
établie dans la partie éboulée.

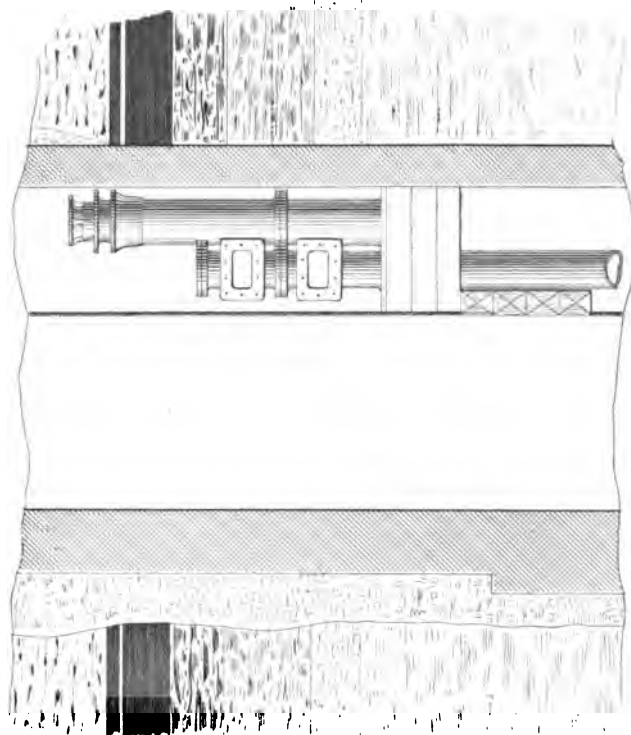
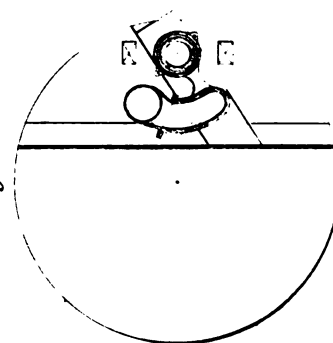
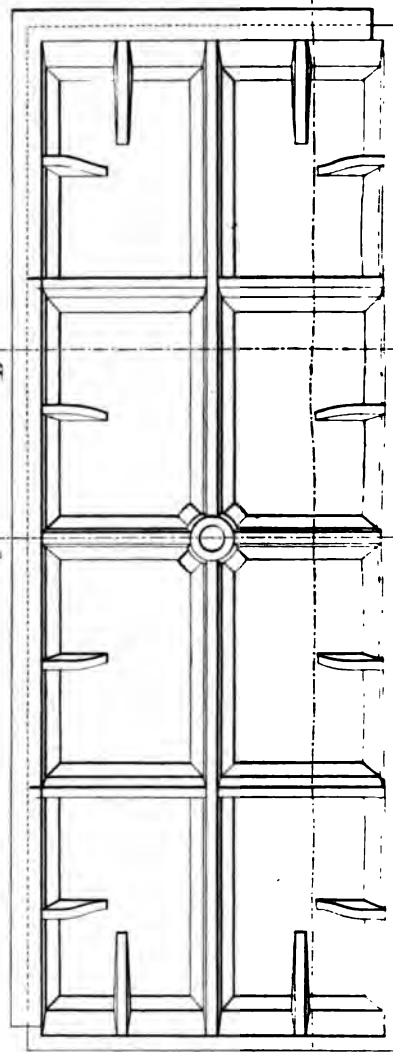


Fig. 6.



Coupe de la pompe.



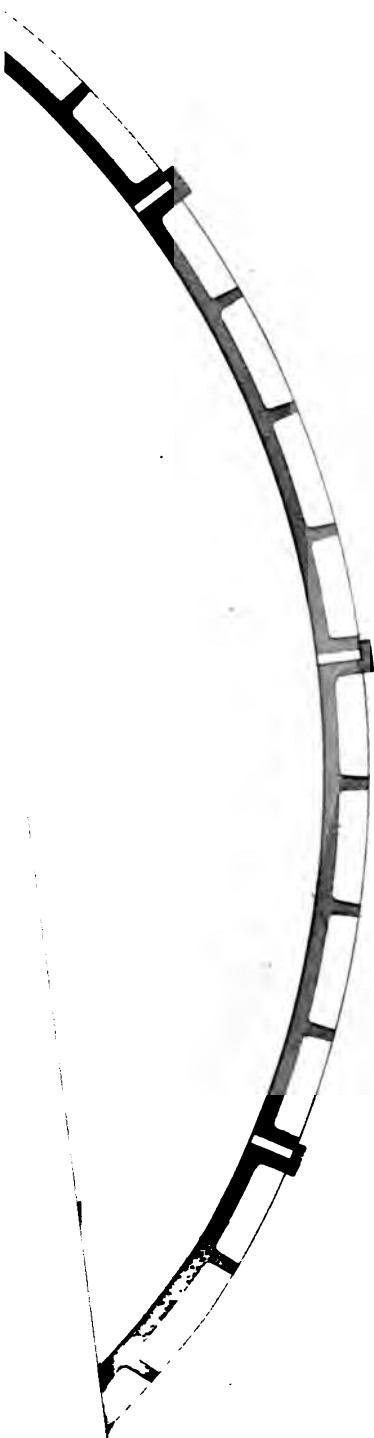


Fig. 8.
Coupe suivant
A B

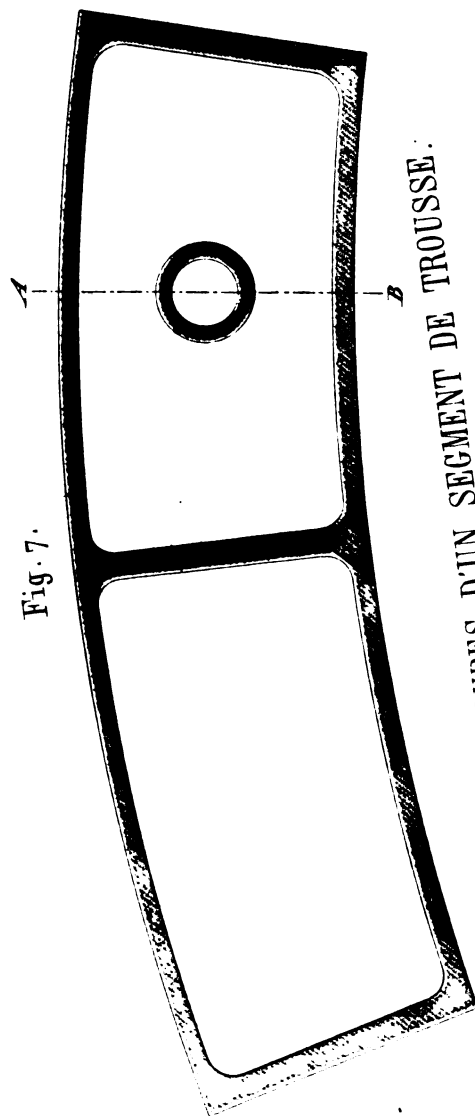


Fig. 7.

Fig. 10.
Coupe suivant
E F

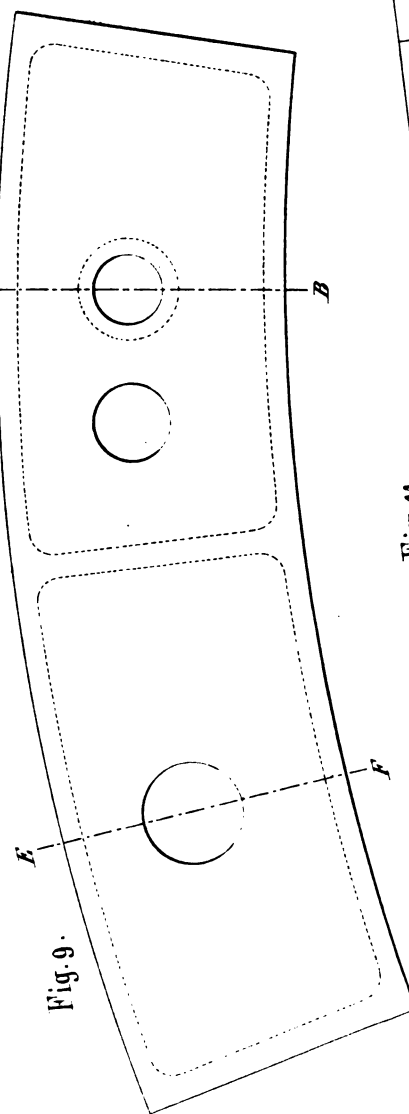
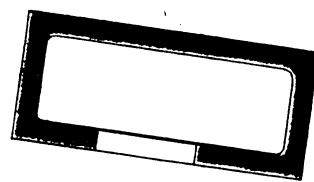


Fig. 9.

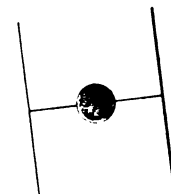


Fig. 11.

Poids d'un segment: 3,7 Kilog.

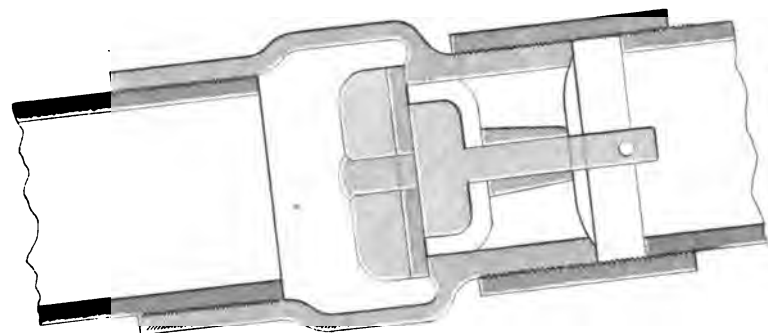
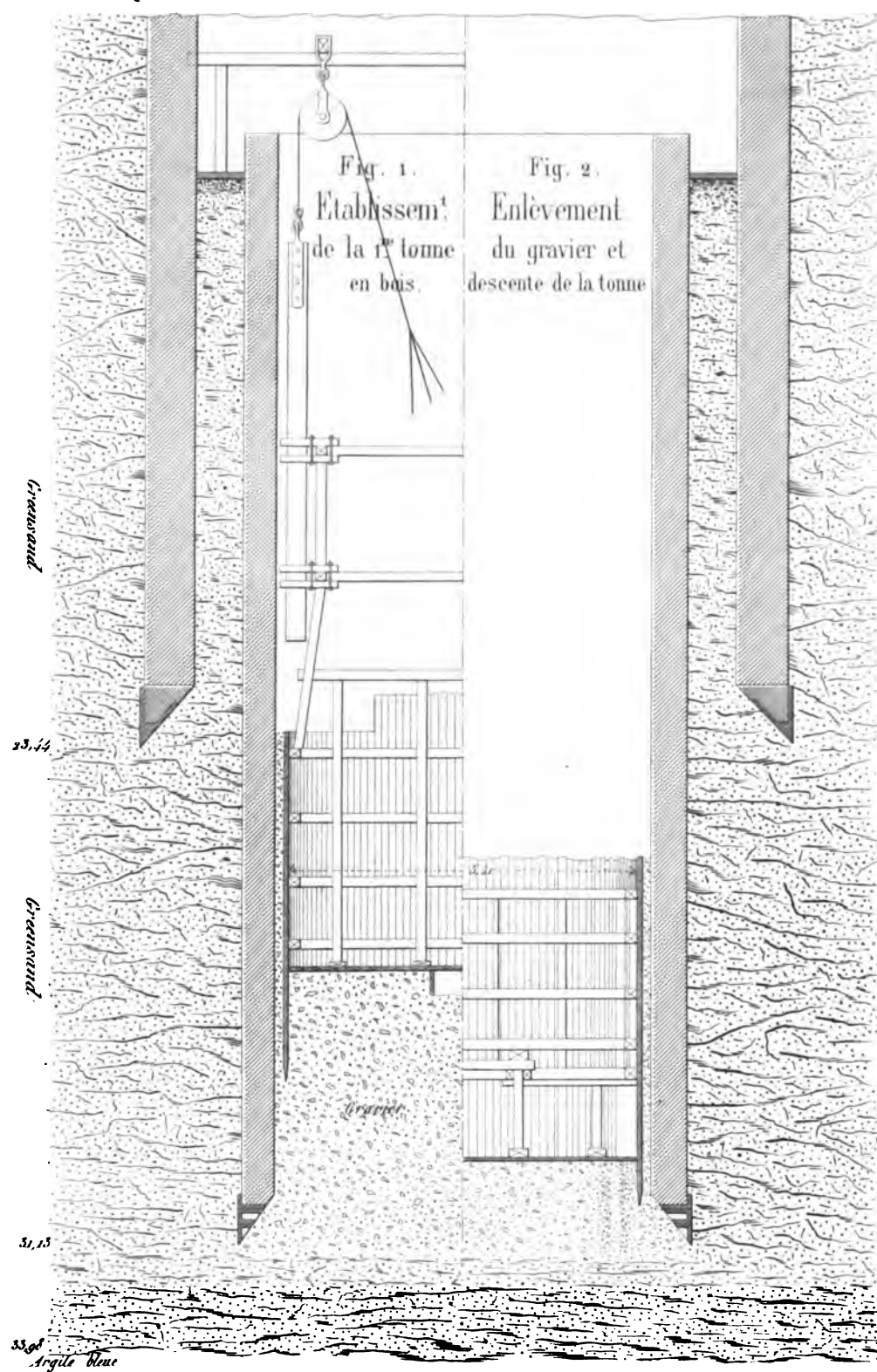


Fig. 12. Coupe d'un clapet
pour renvoi de niveau.
Ech. 1/2.



Ecartement

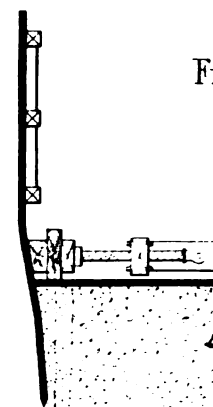


Fig. 4

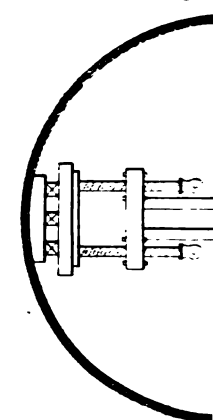


Fig. 5.
Fermeture des gargouilles
de la maçonnerie.

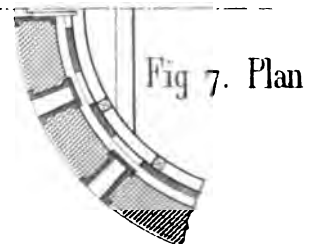
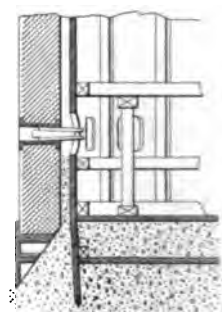
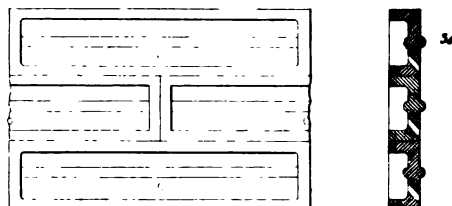


Fig. 13 et 14. Segments des tubings en fonte. (0,05)



es palplanches.

p. 3.

erier.

Plan.

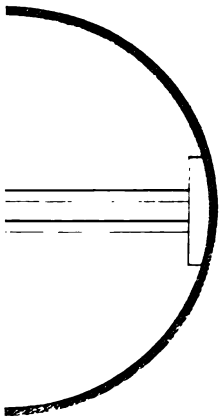


Fig. 8.
Deuxième tonne en bois
et tonne en fer.

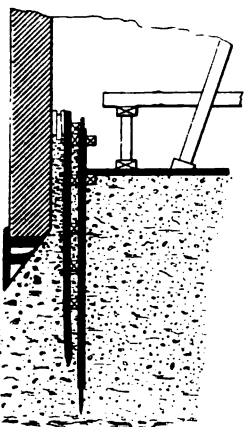


Fig. 11 et 12.
Fausse
trousse.
(0, 03)

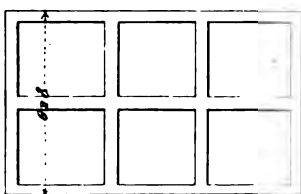


Fig. 10.

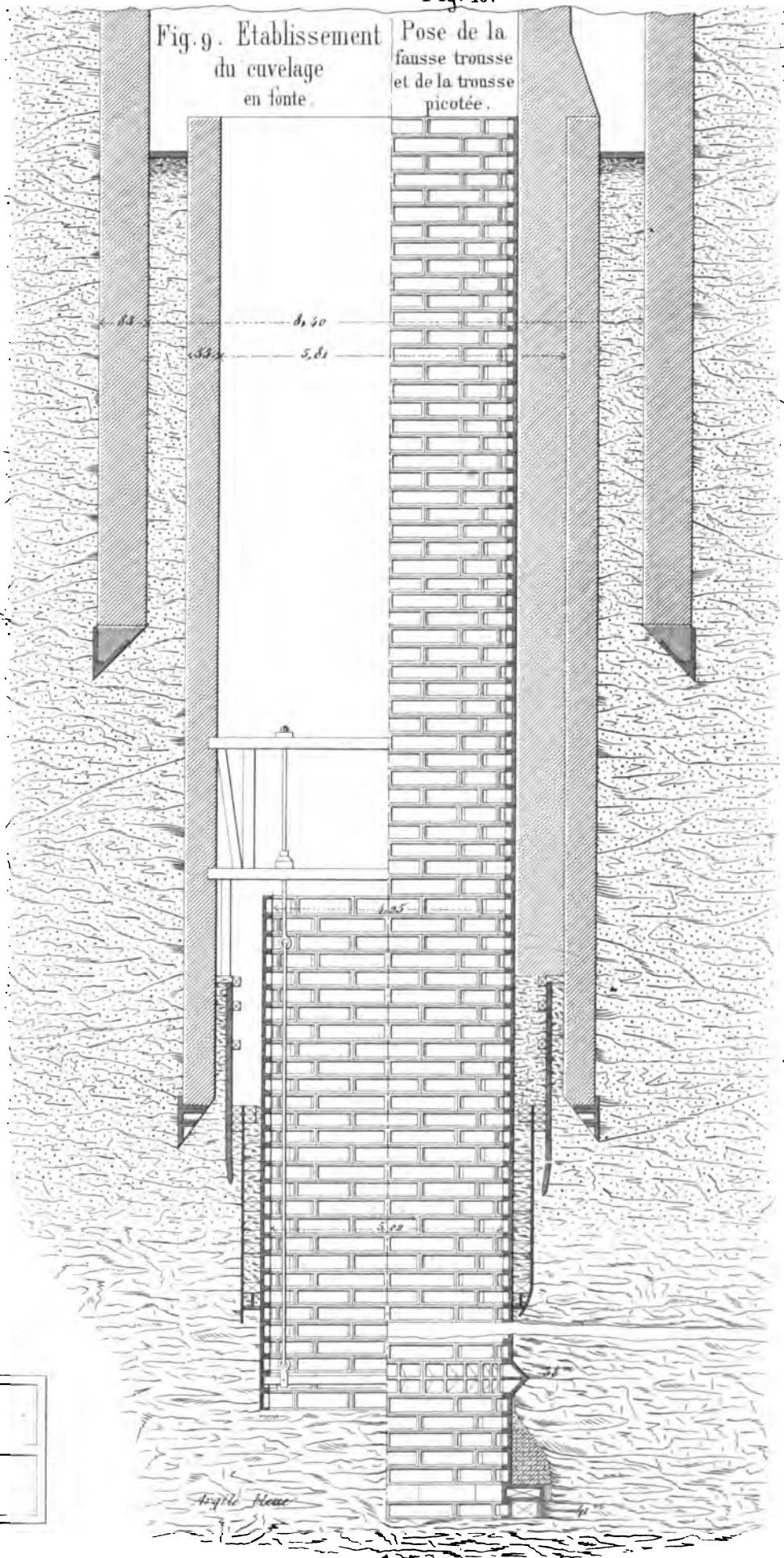


Fig. 1.
Trousse coupante et cuvelage.

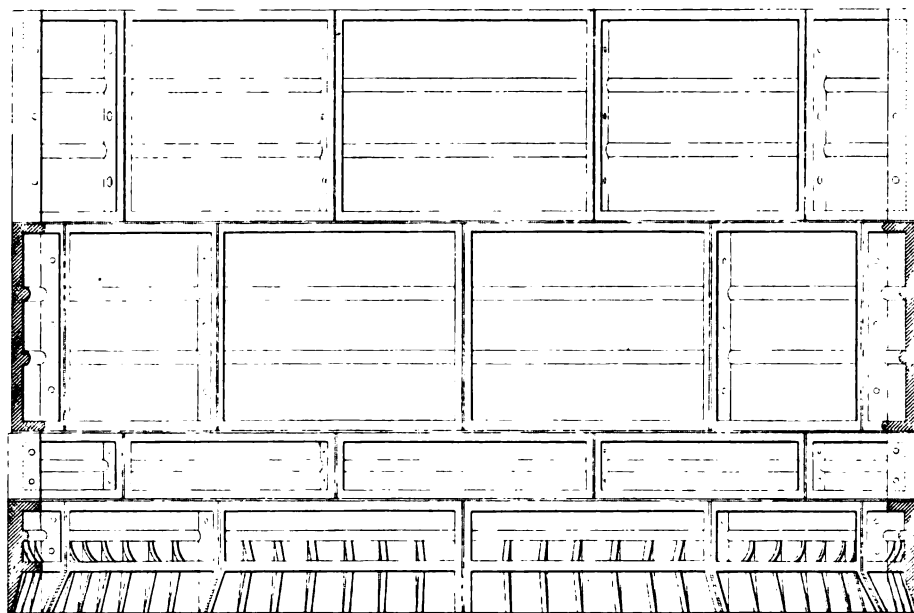
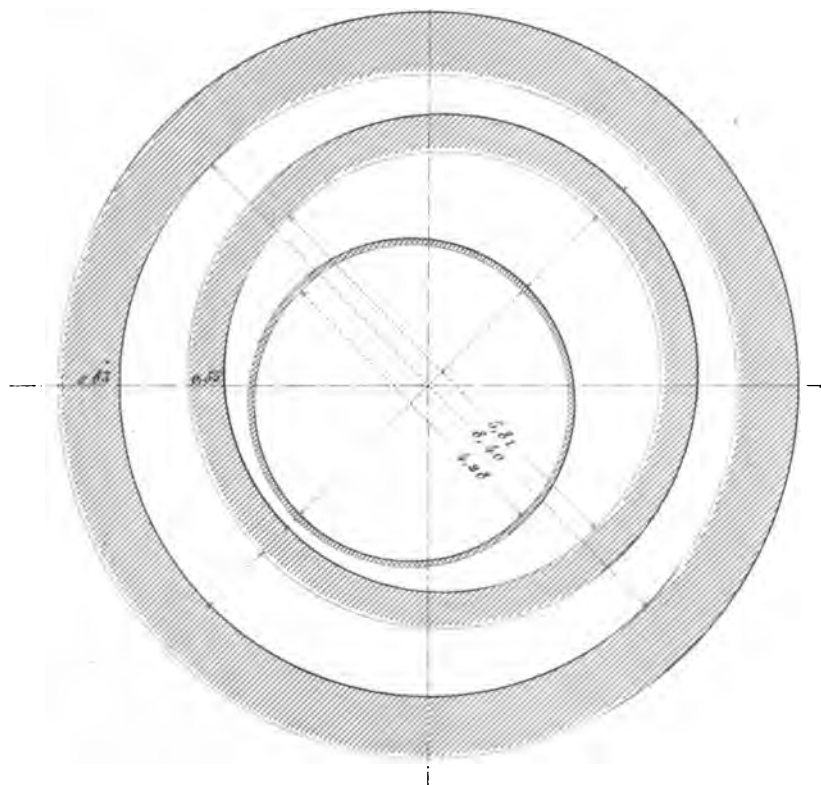


Fig. 2.
Position des maçonneries et du cuvelage.



AVALER
Disp

Fig.

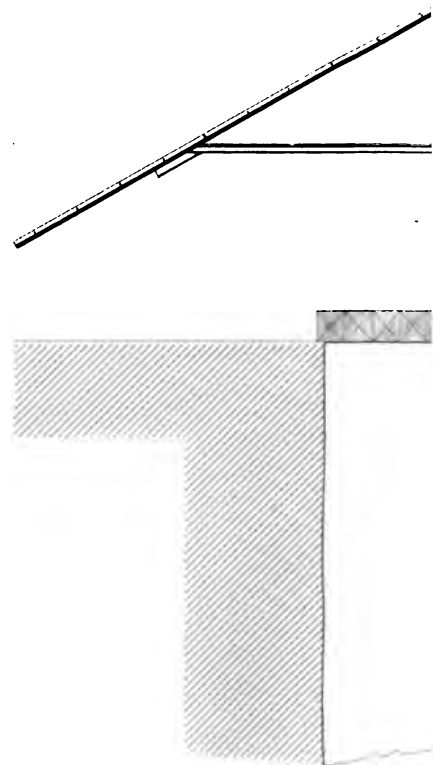


Fig. 6. Tube à bétonner
le fond du puits.

ESSE DE RHEIN RUHR.
Position de la drague.

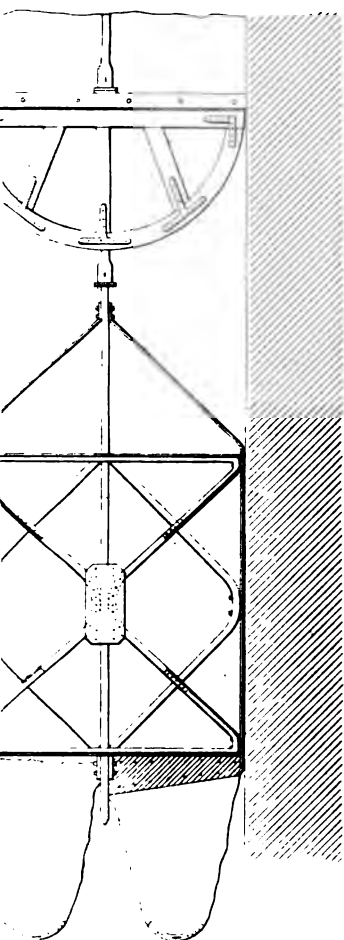
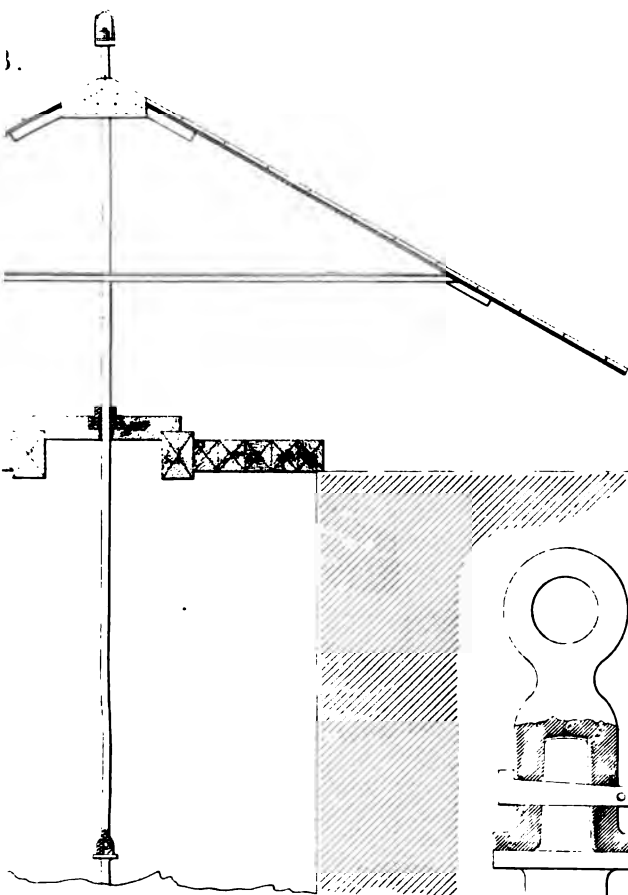


Fig. 5. Suspension des
tiges au câble. ($\frac{1}{10}$)

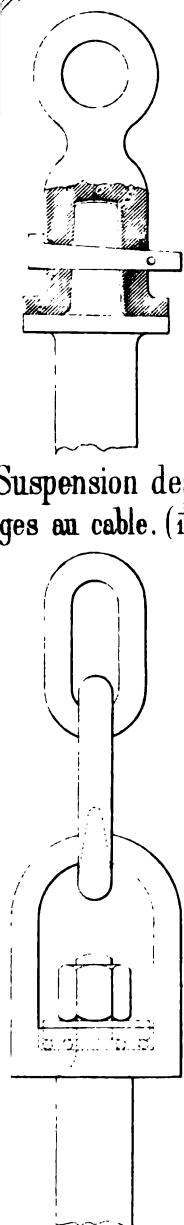


Fig. 4.
Cuvelage en fonte.

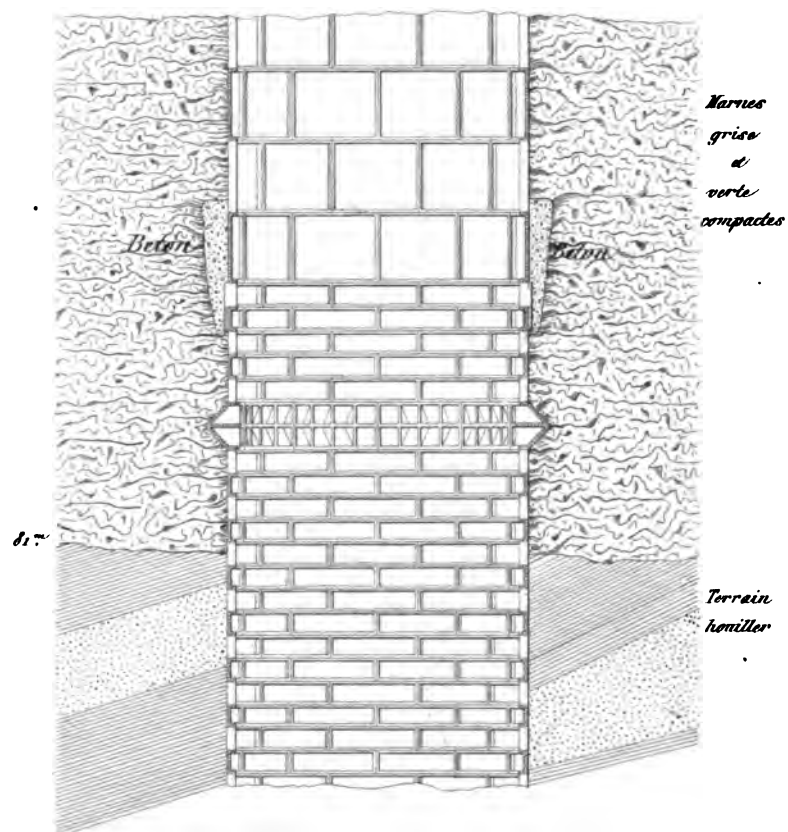
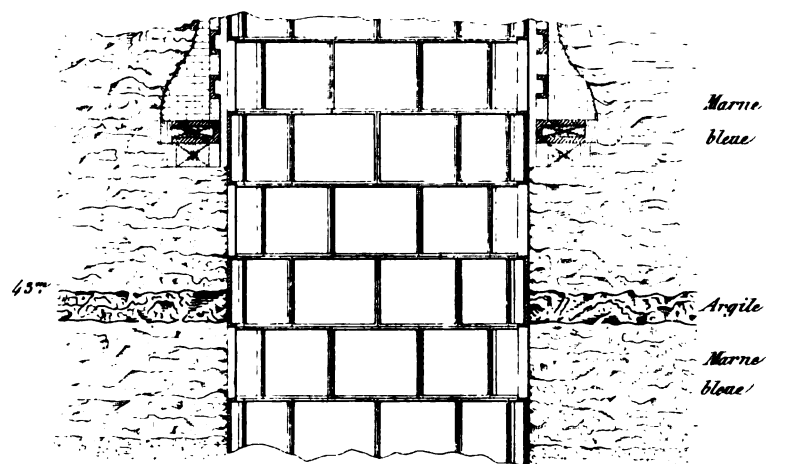
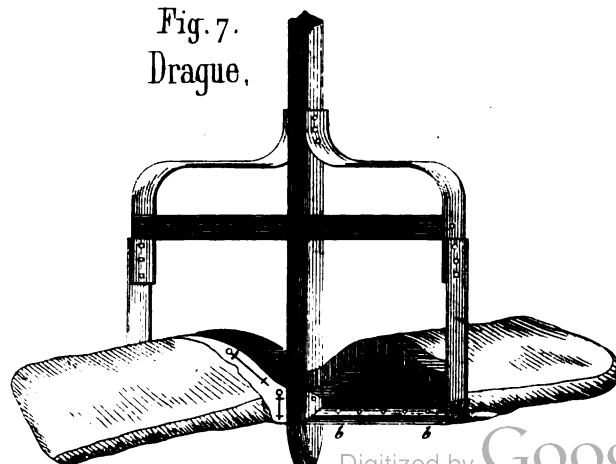


Fig. 7.
Drague.



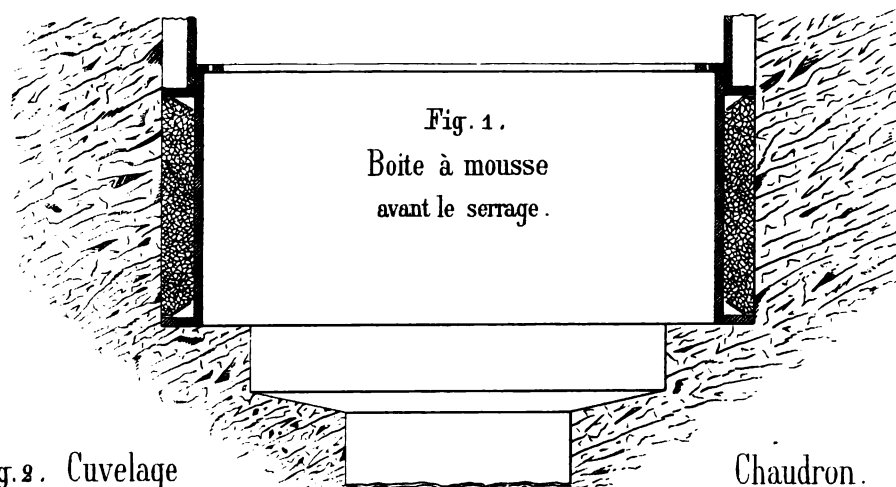
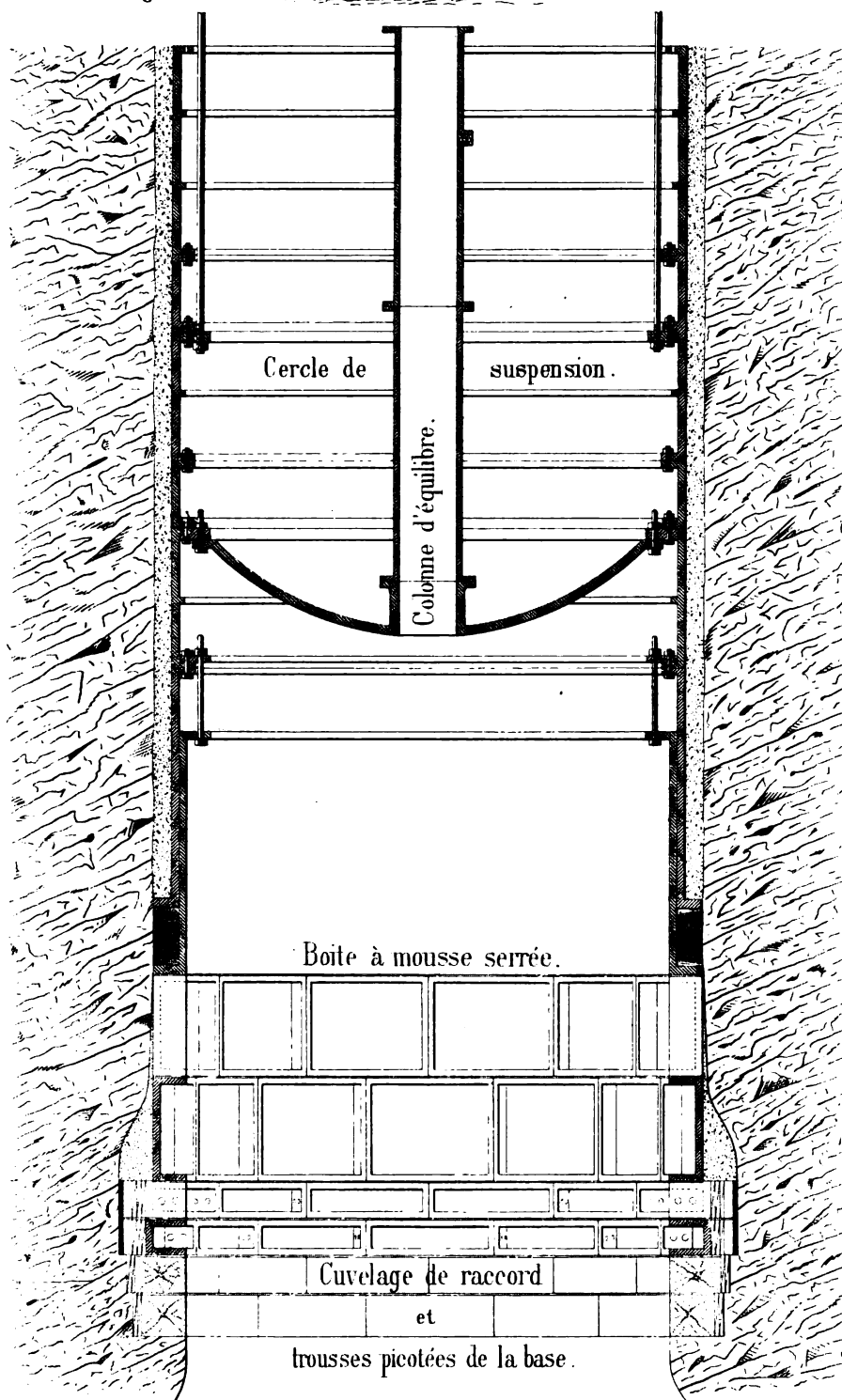


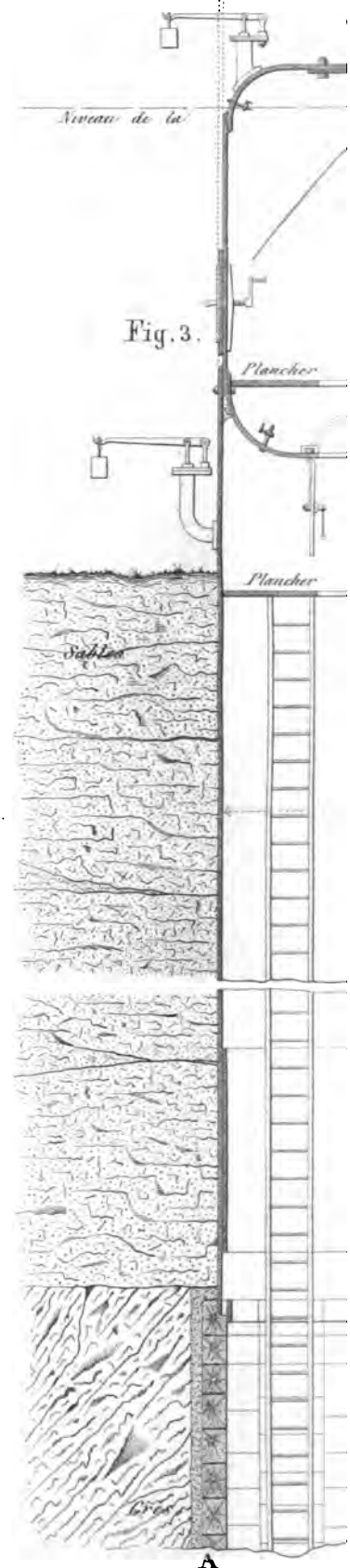
Fig. 2. Cuvelage

Chaudron.

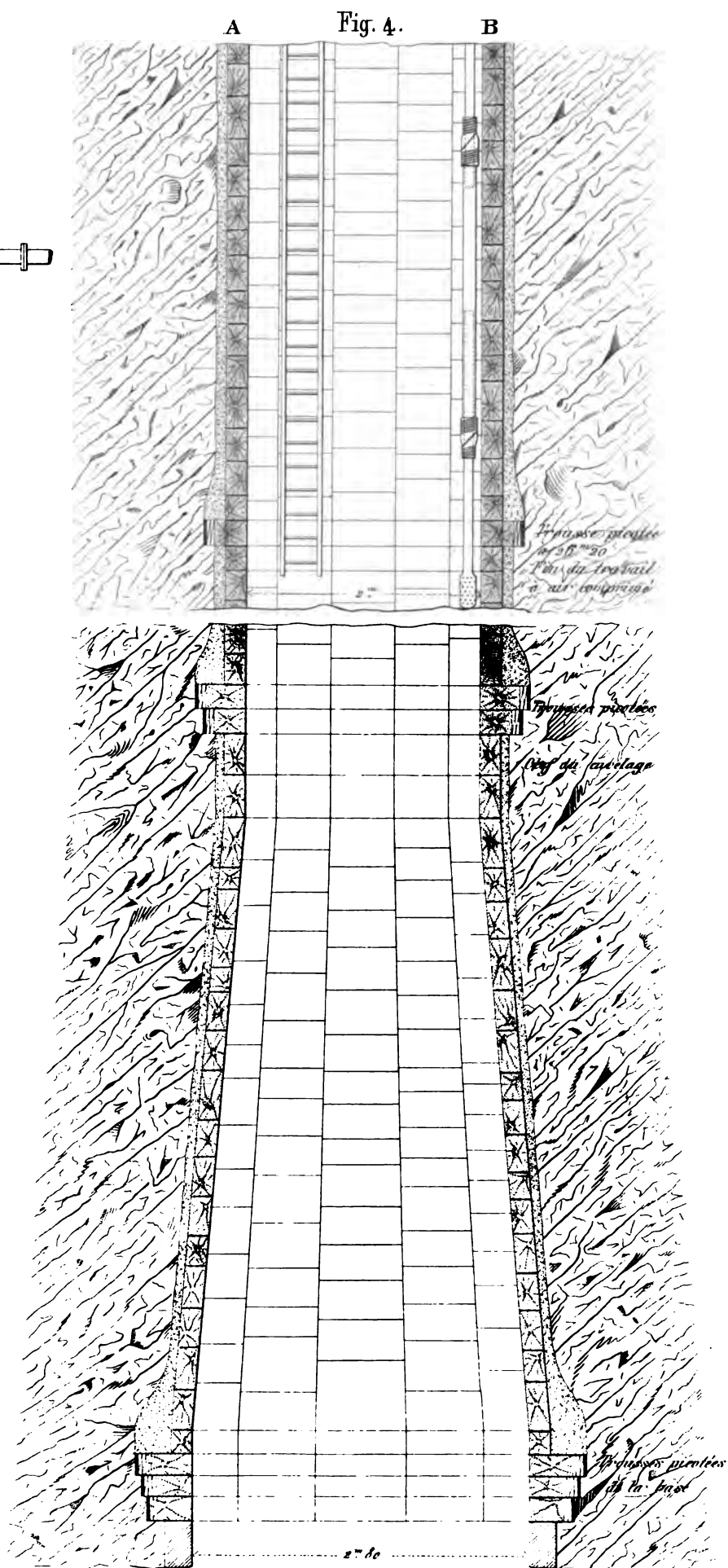
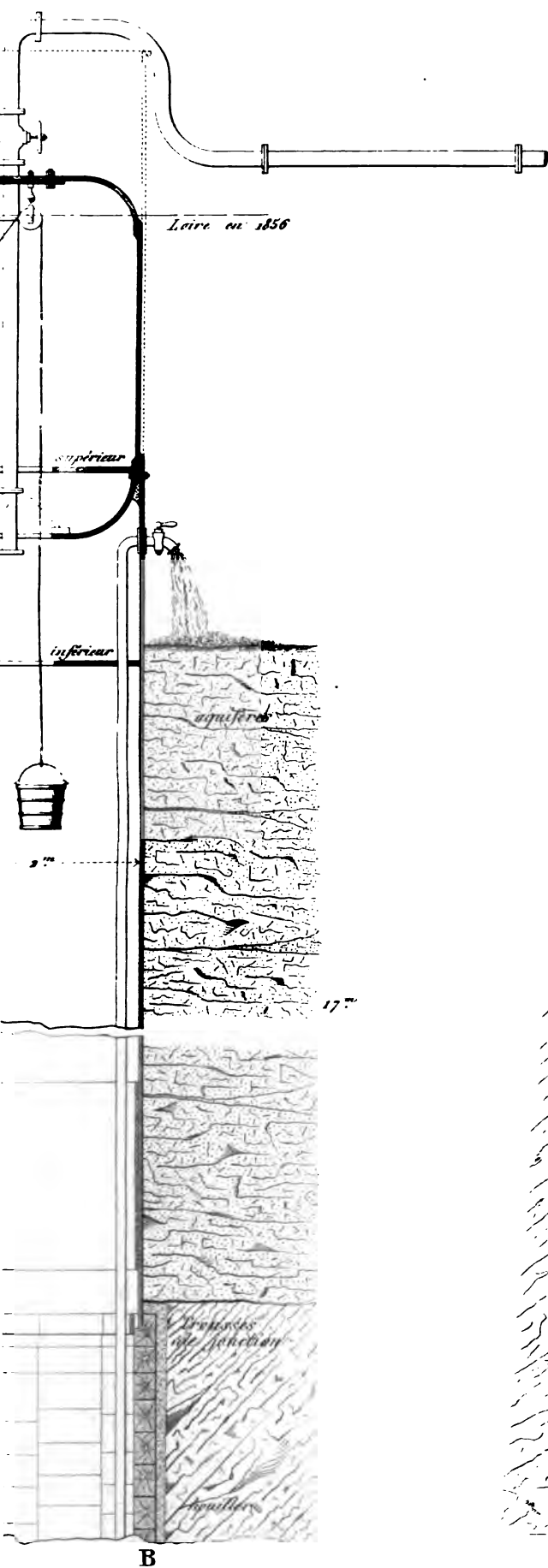


Puits N° 4 DES M APPAREIL A AIR COMPRIMÉ E

Tube de relance
placé après
le fonçage.



NES DE CHALONNES.

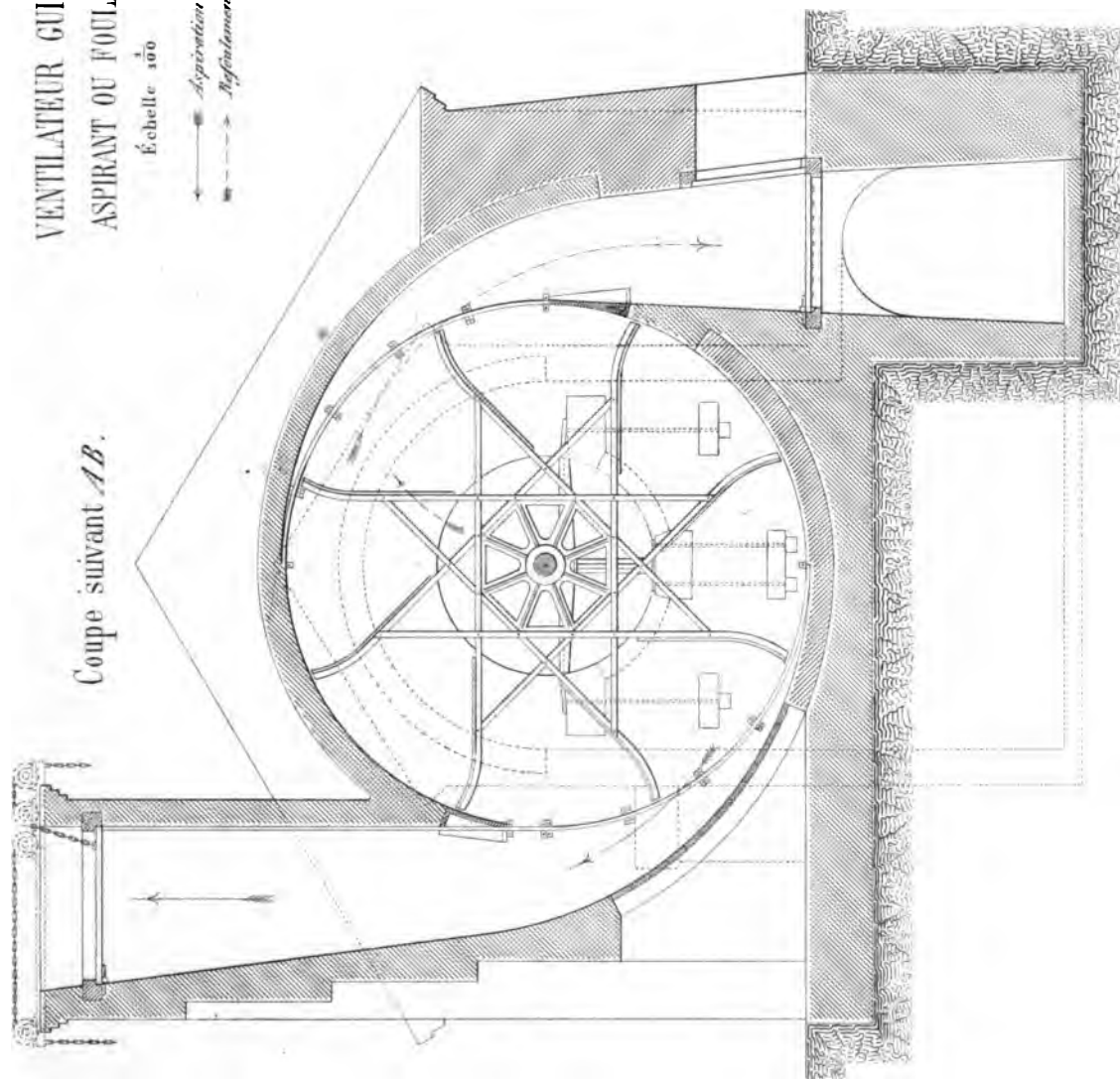
PLOYÉ PAR M^r FACÈS EN 1858.

VENTILATEUR GUIBAL
ASPIRANT OU FOULANT.

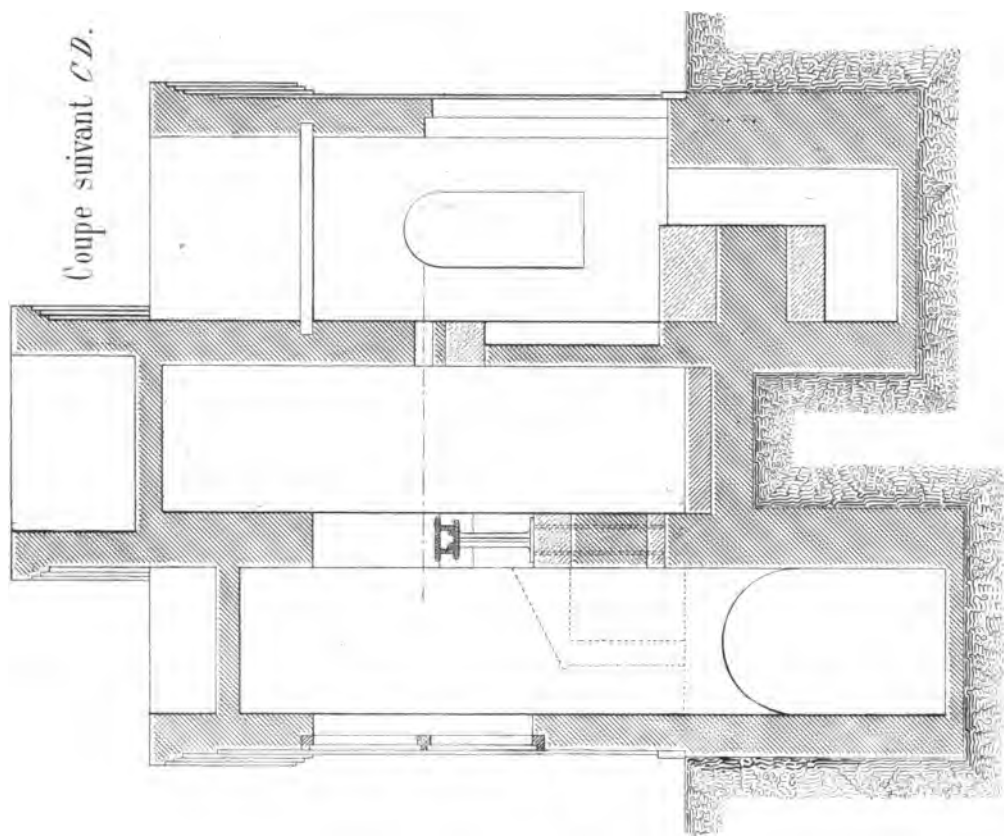
Échelle $\frac{1}{100}$

Aspiration
Refoulement

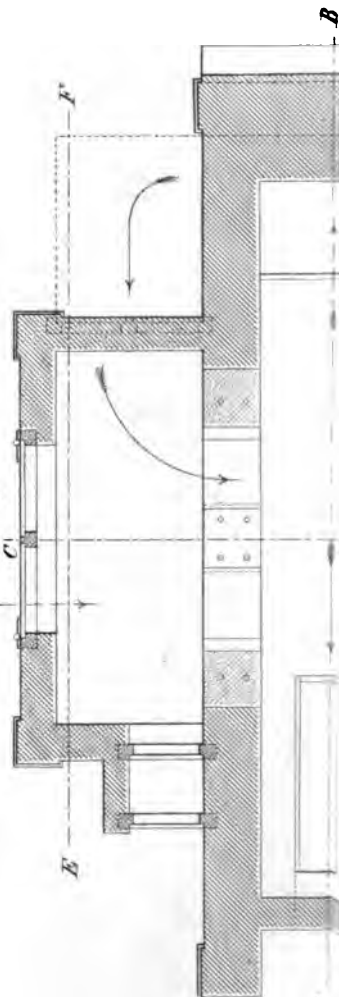
Coupe suivant *AB*.



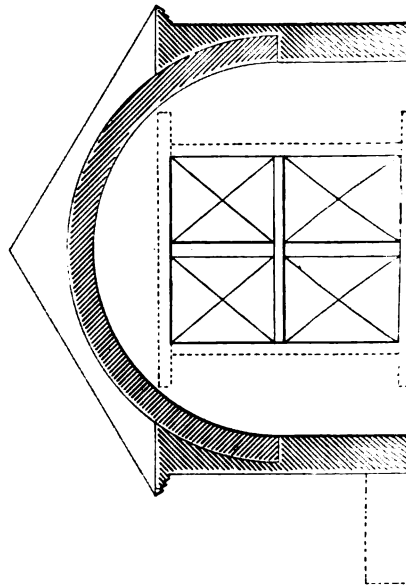
Coupe suivant *CD*.

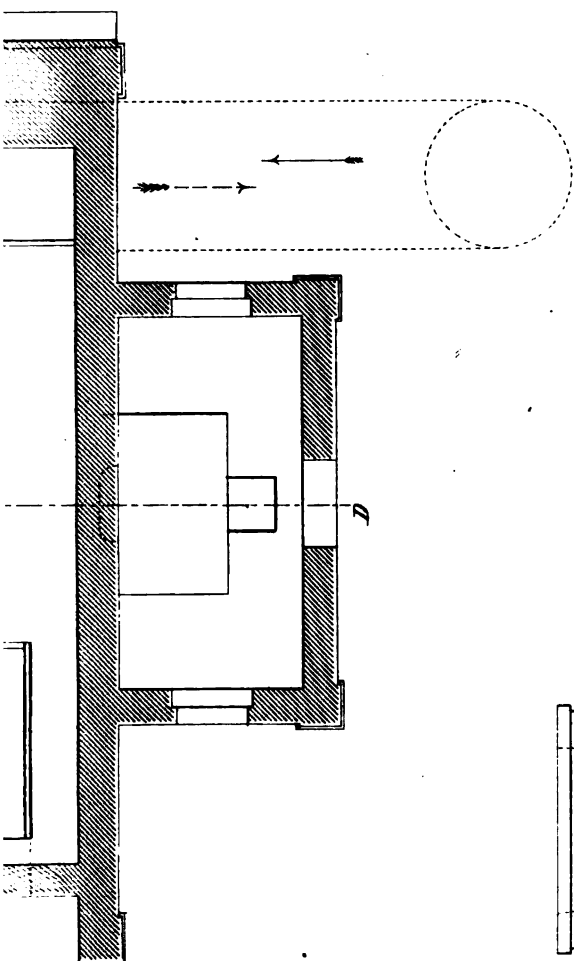
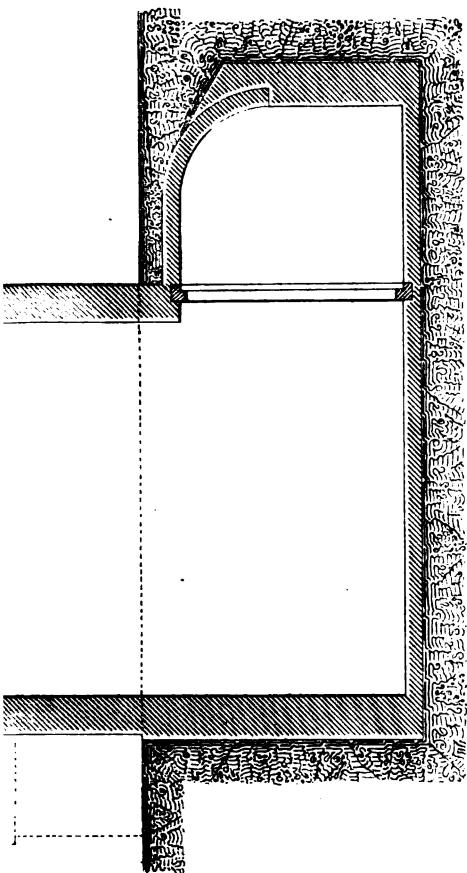


Plan et Coupe par l'axe.

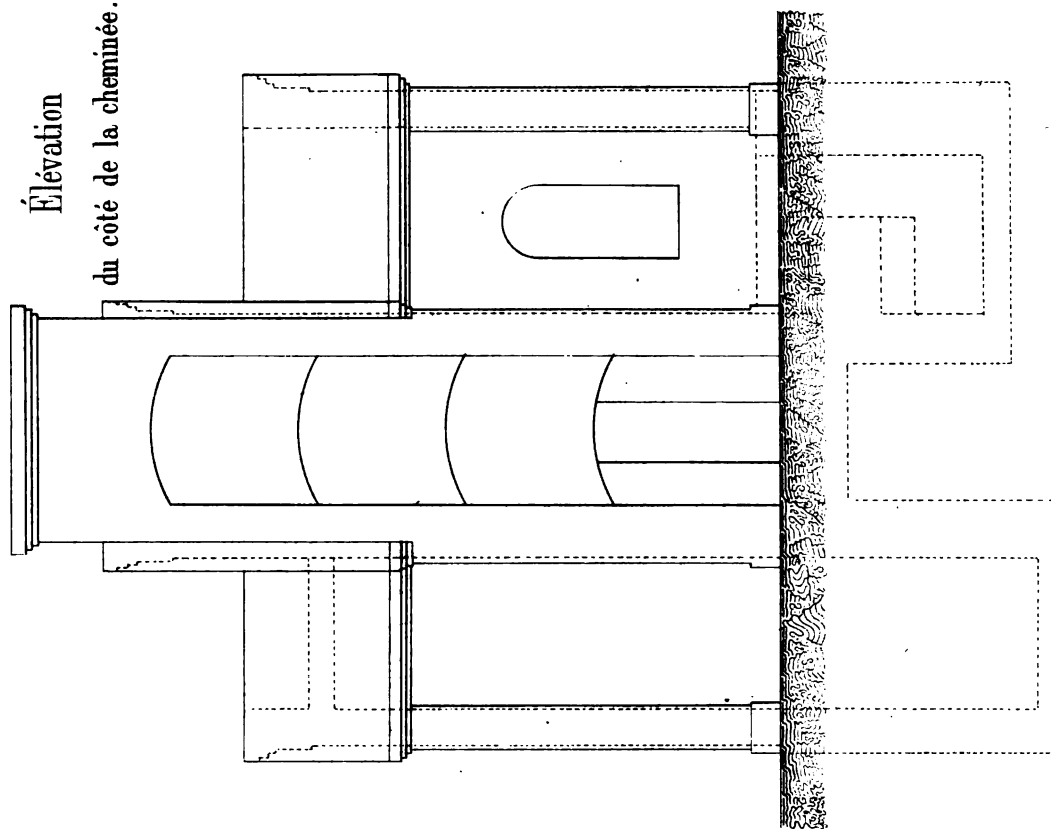


Coupe suivant *EF*.

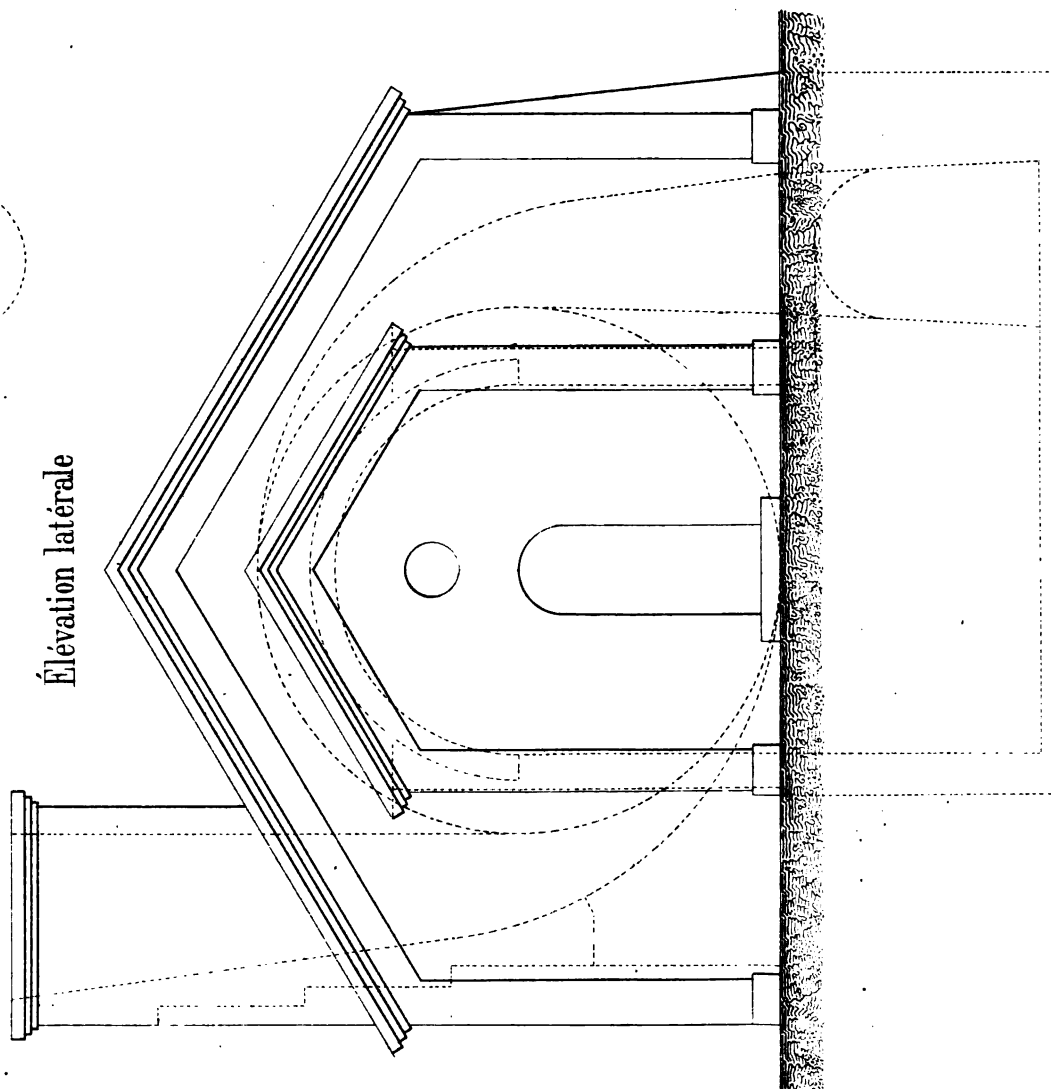




Élévation
du côté de la cheminée.



Élévation latérale



VENTILATEUR S^{TE} EUGENI
SYSTÈME CI

Fig.1. Coupe suivant $G H K$ du plan.

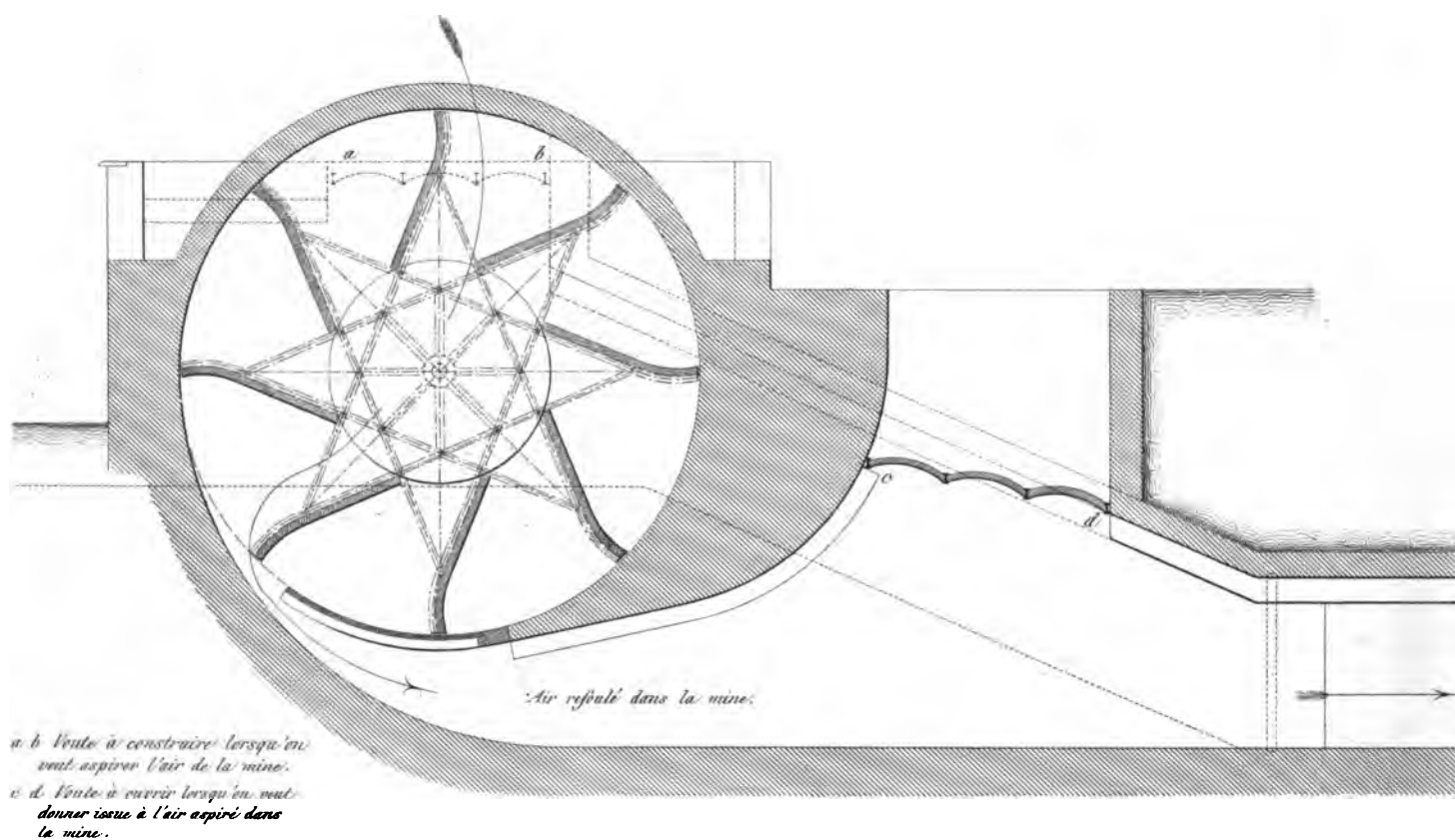
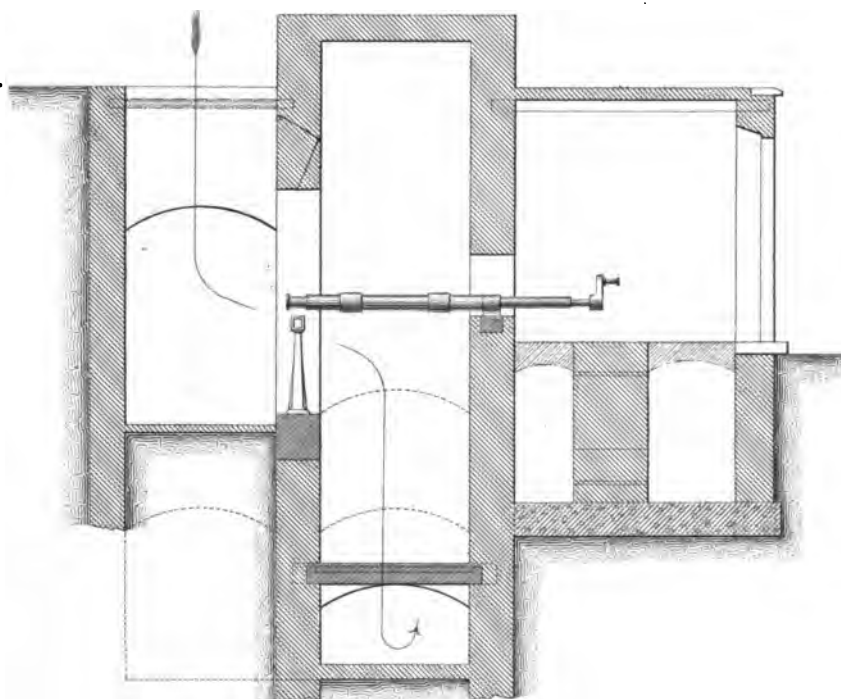


Fig.3. Coupe suivant $M N$ du plan.

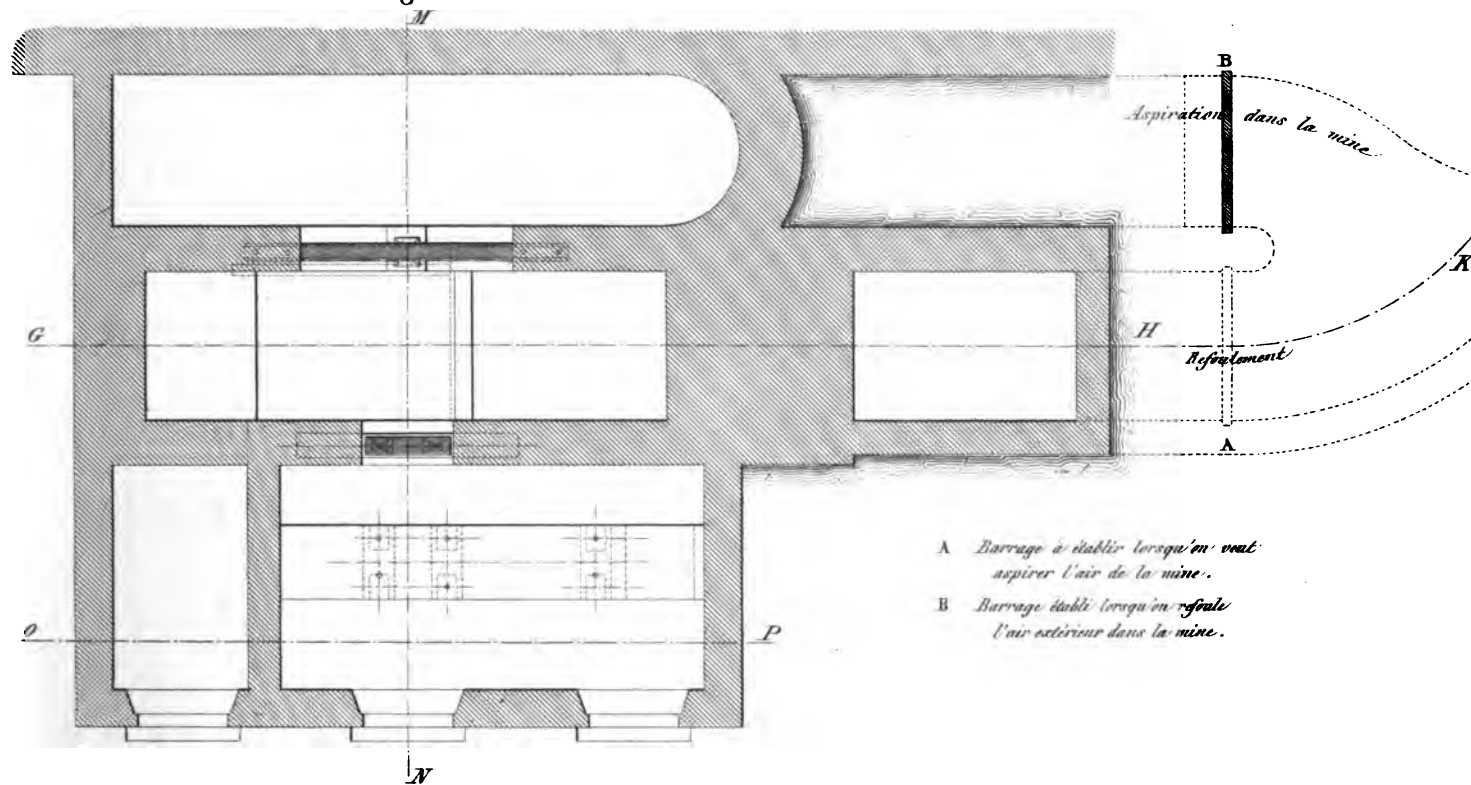
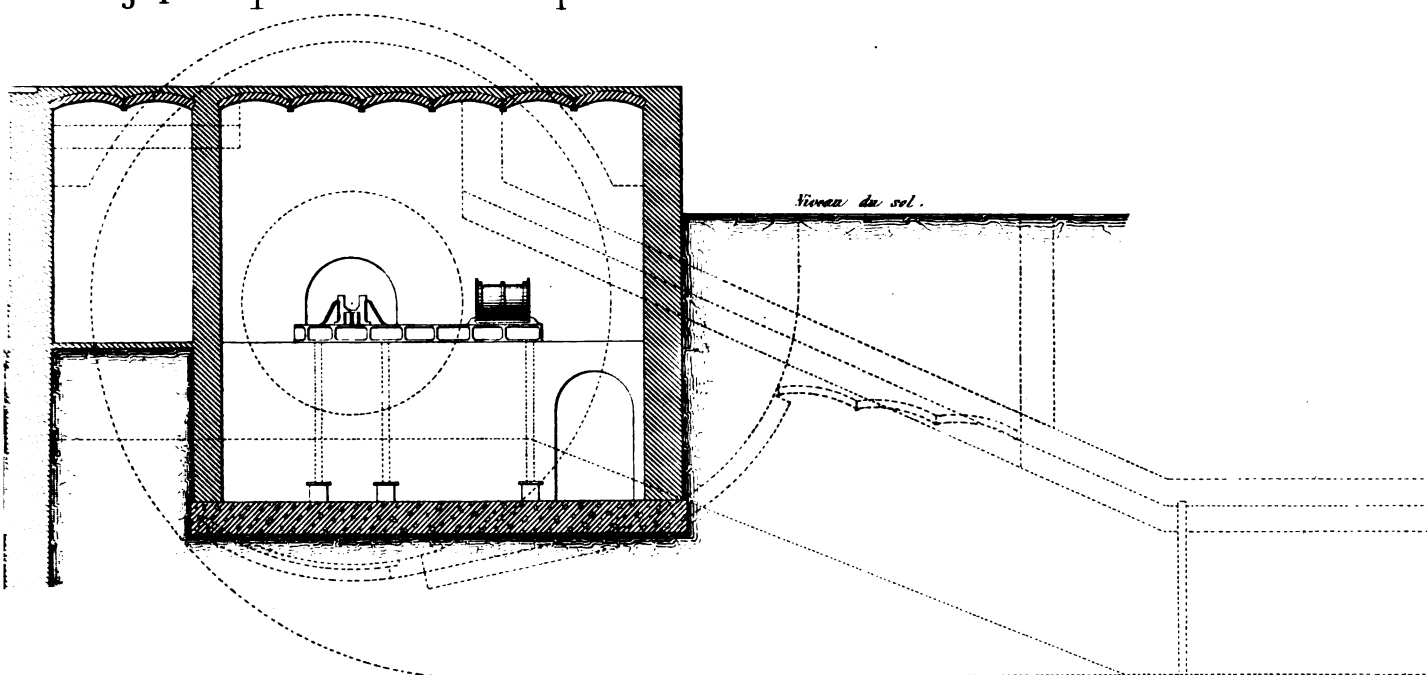


E A MONTCEAU LES MINES.

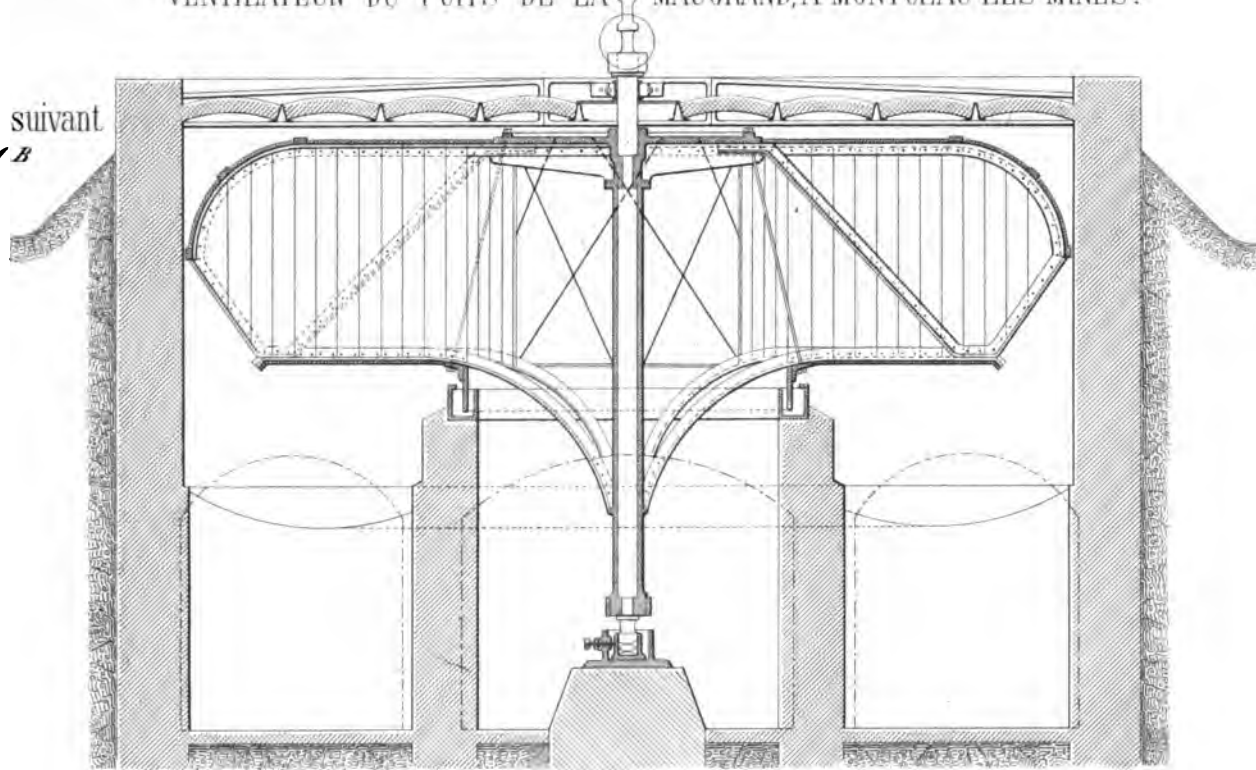
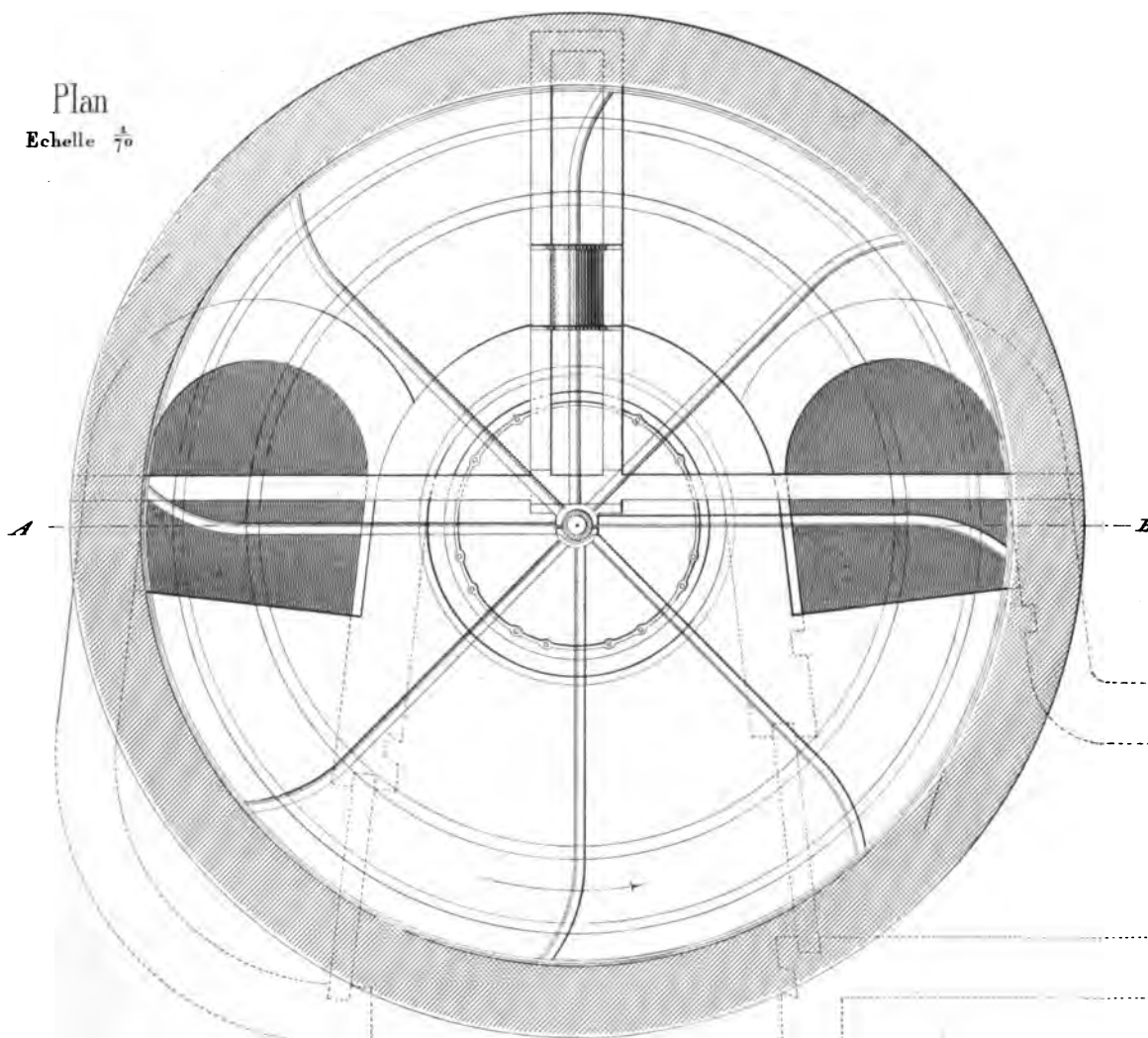
TAL MODIFIÉ.

1888.

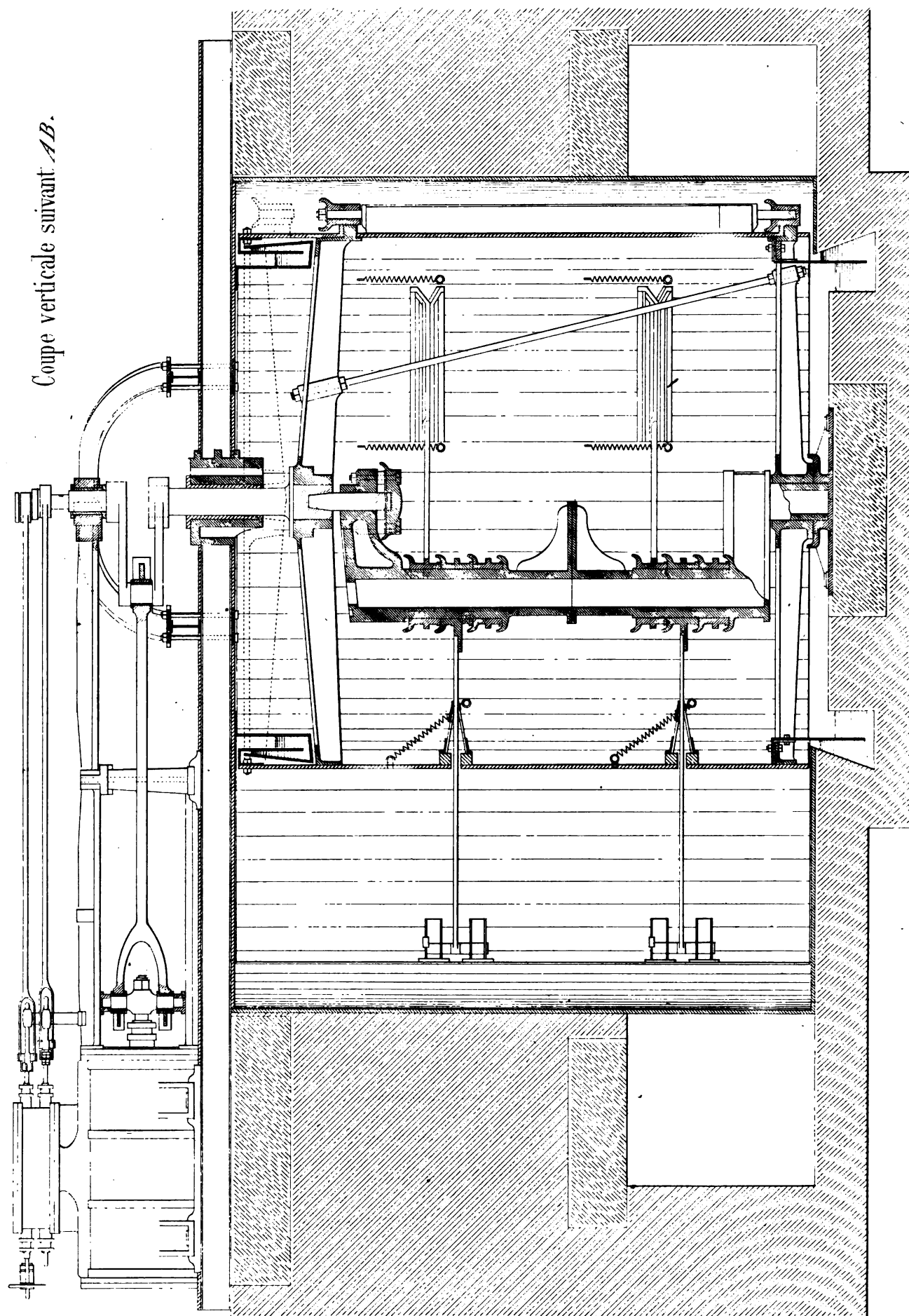
Fig. 2. Plan du ventilateur.

Fig. 4. Coupe suivant OP du plan.

VENTILATEUR DU Puits de LA MAUGRAND, A MONTCEAU LES MINES.

Coupe suivant
ABPlan
Echelle $\frac{1}{70}$ 

VENTILATEUR LAMÉLLE.



Plan.
Échelle 40.

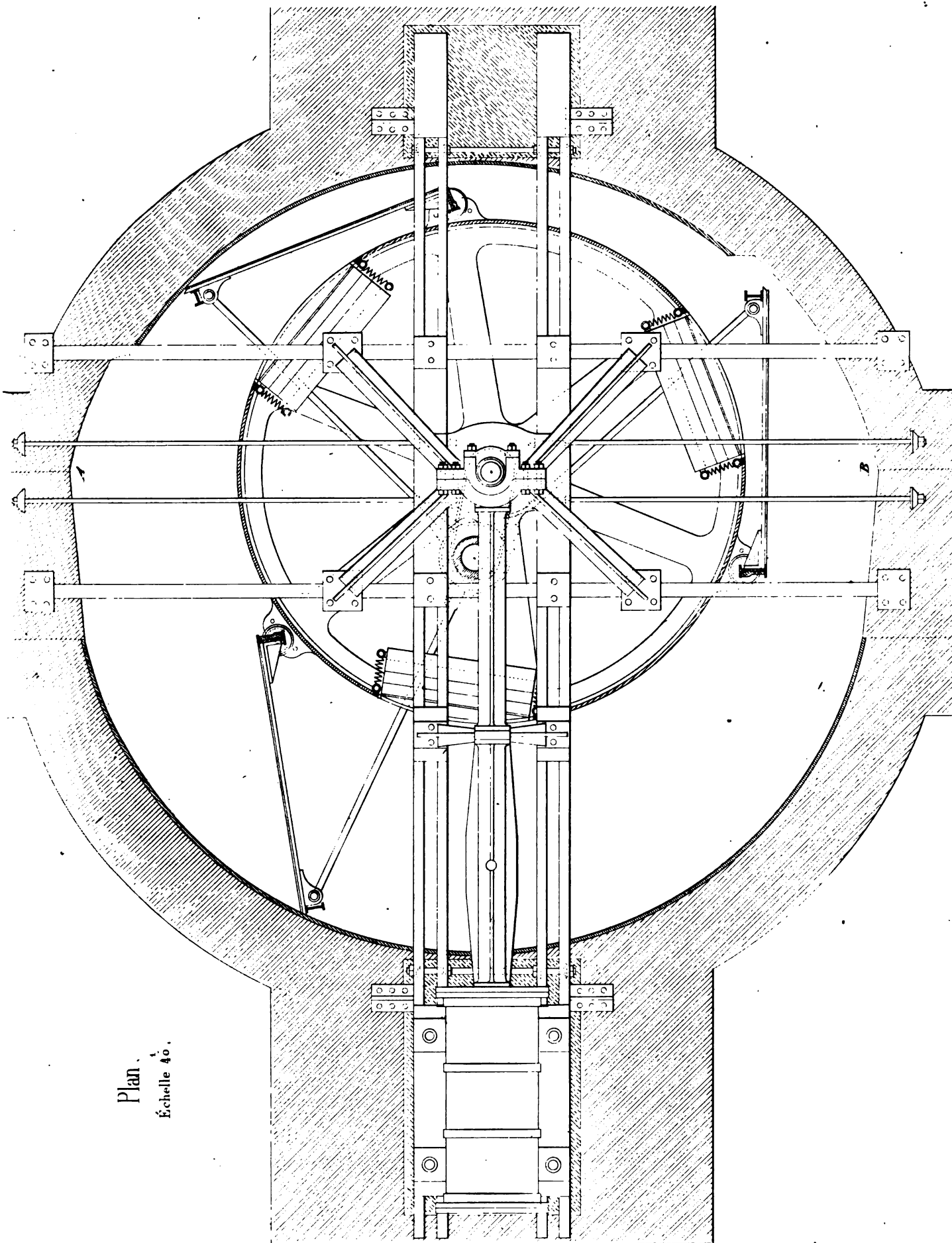


Fig. 2. VENTILATEUR HARZÉ. Plan.

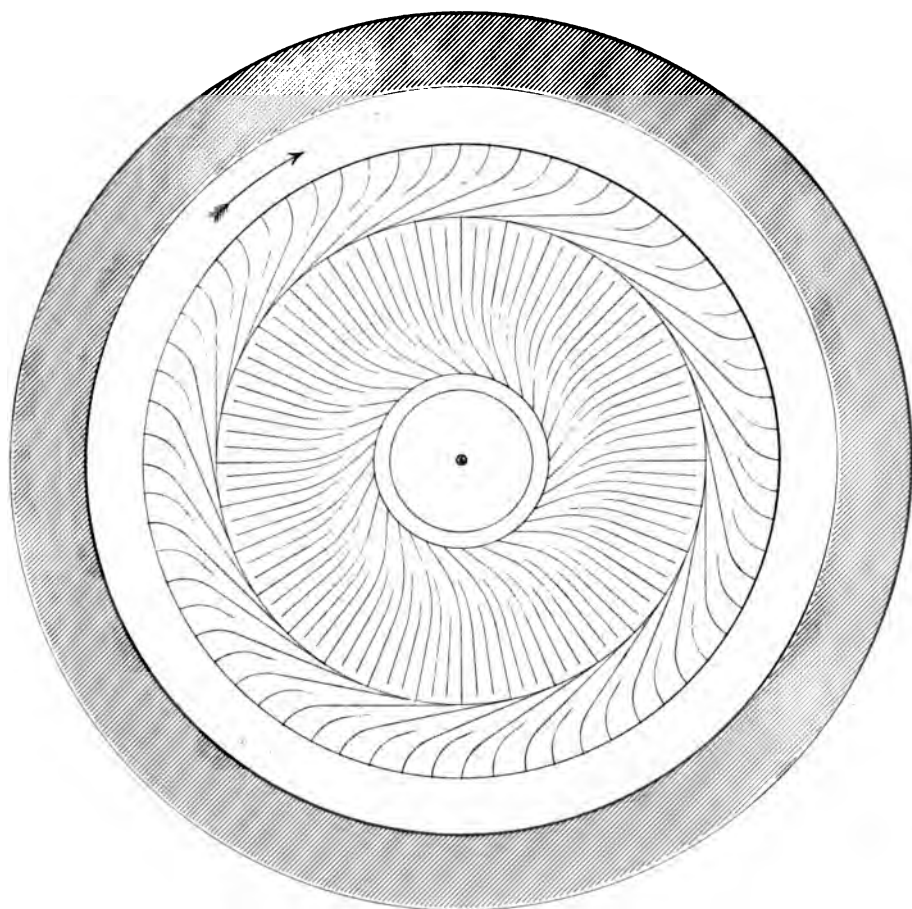


Fig. 3. VENTILATEUR HARZÉ. Coupe.

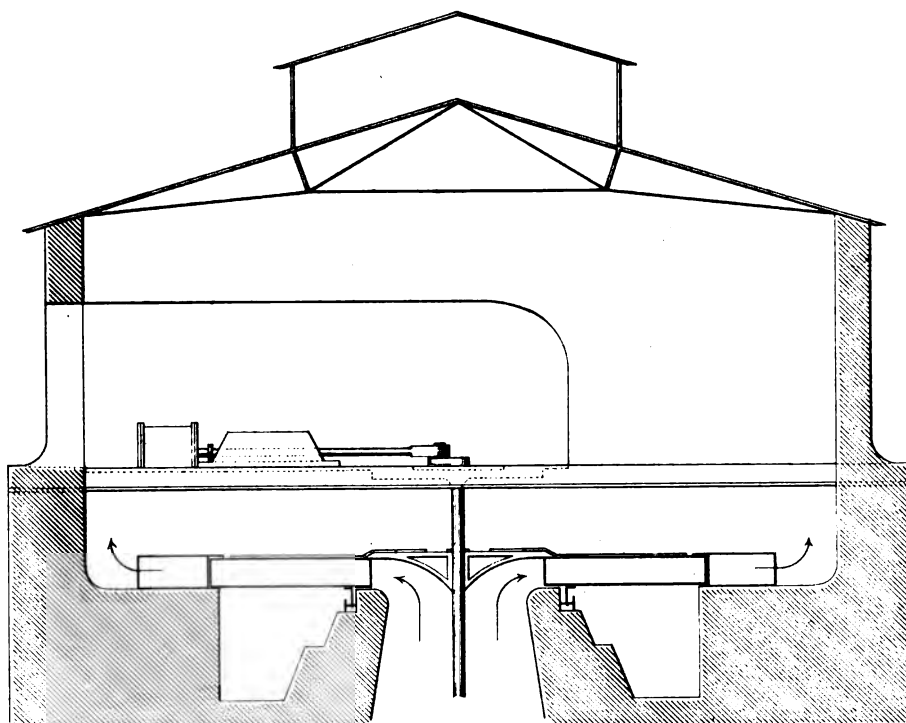


Fig. 1. VENTILATEUR

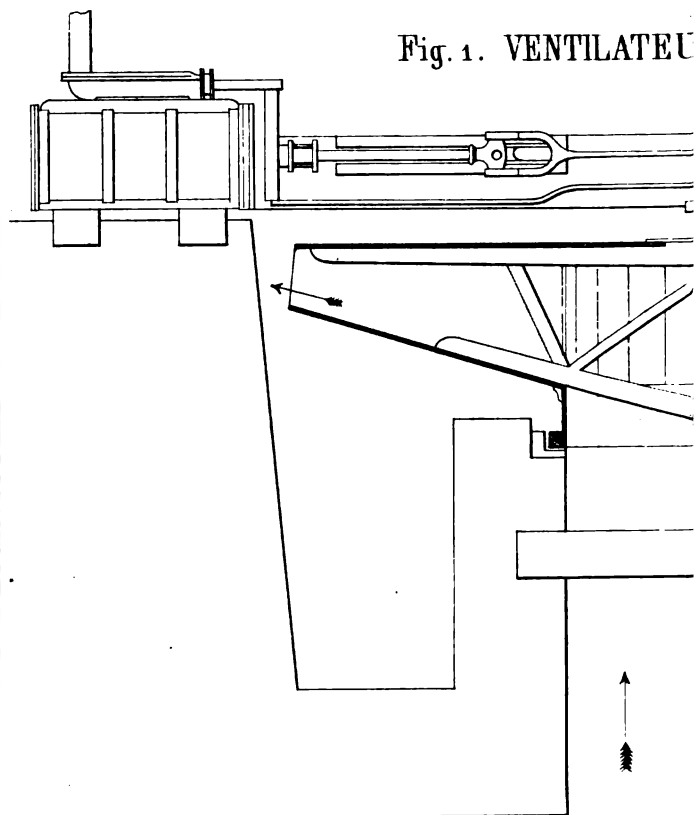
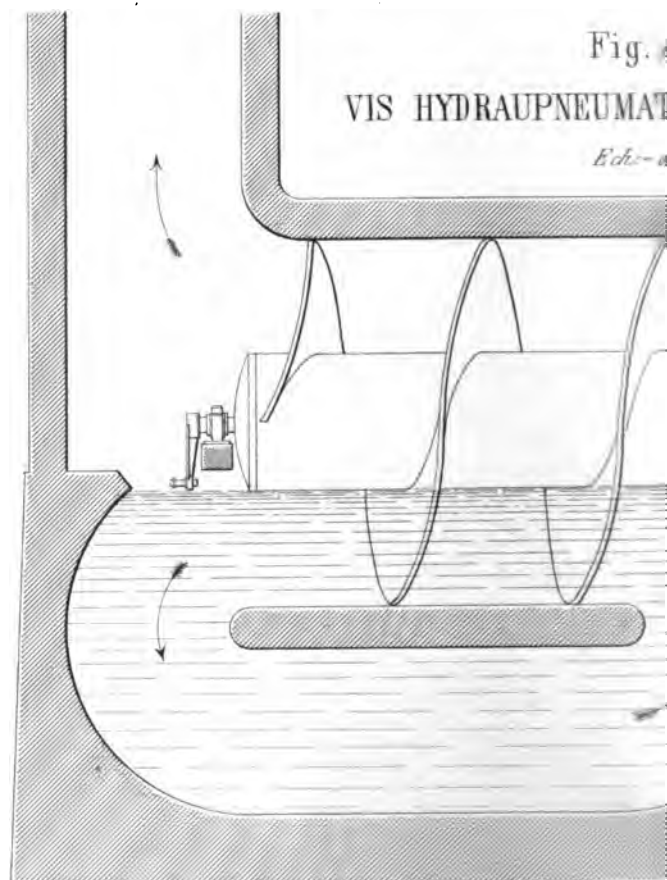


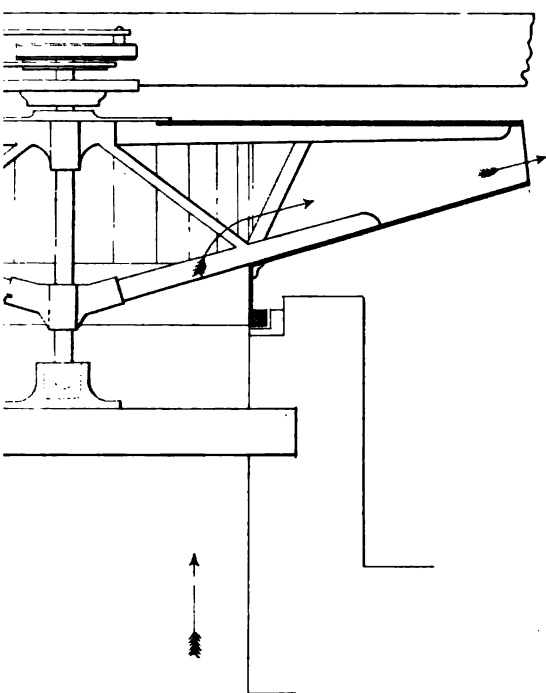
Fig. 4.

VIS HYDRAUPNEUMATIQUE

Echelle



R BRUNTON.



IQUE DE GUIBAL.

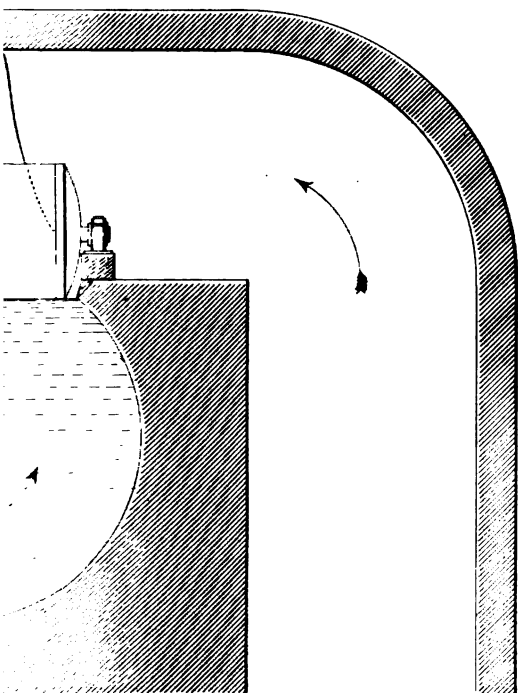


Fig. 5. VENTILATEUR NIXON.

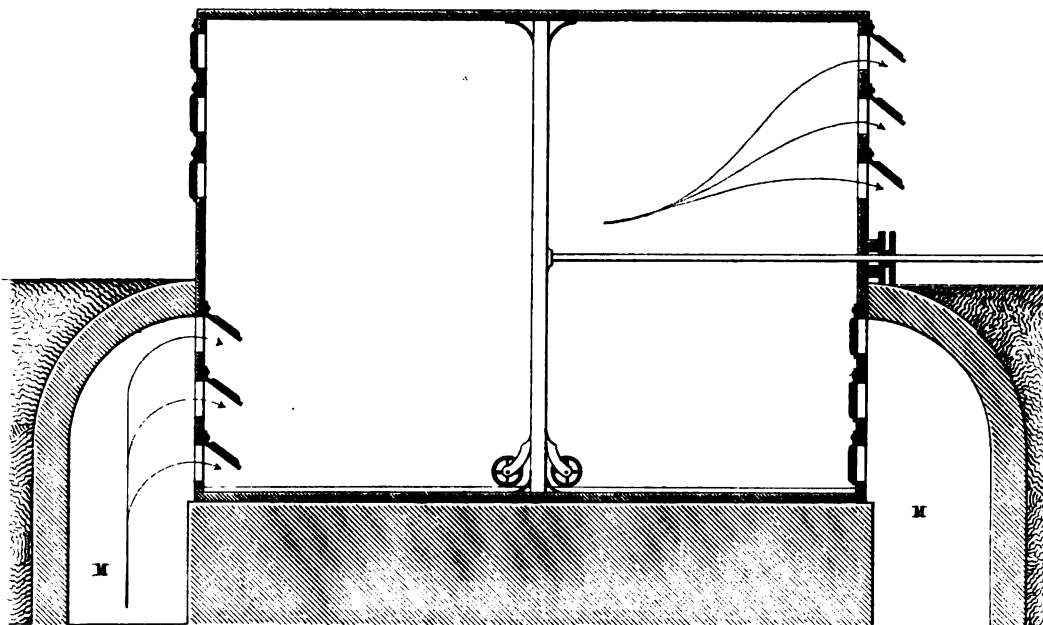


Fig. 6. CLAPETS NIXON.

Fig. 8. CLAPETS MAHAUX.

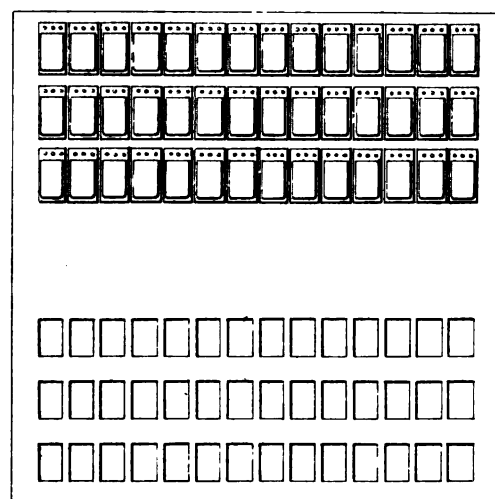
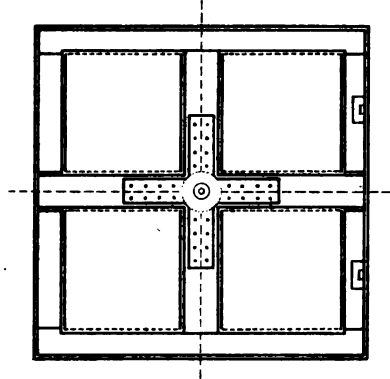


Fig. 7. VENTILATEUR MAHAUX.

Ech. = 0,01.

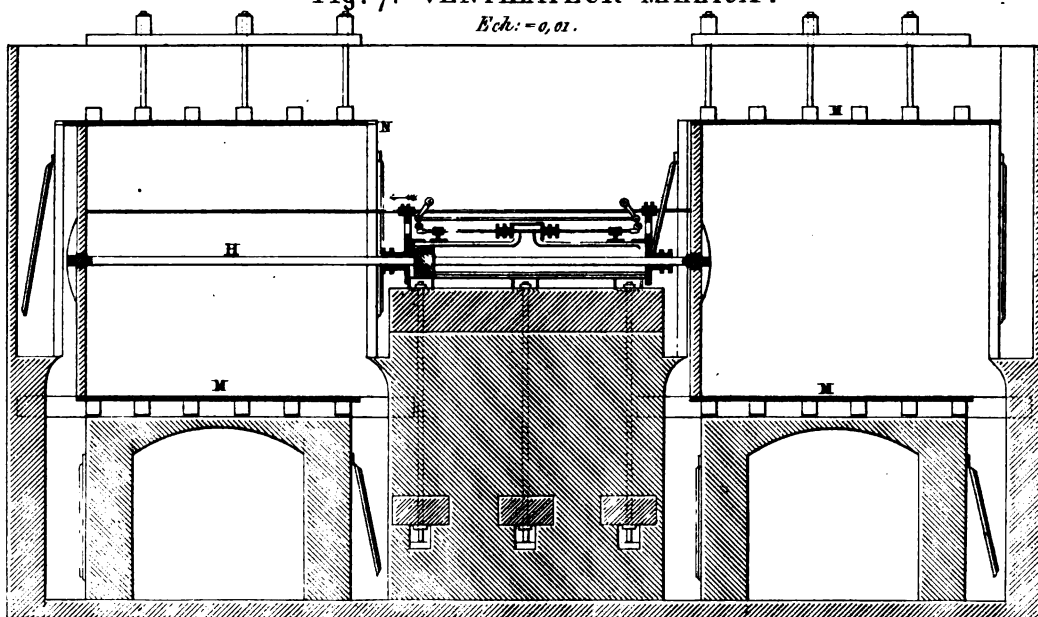


Fig. 1. BERLINE D'ANZIN.

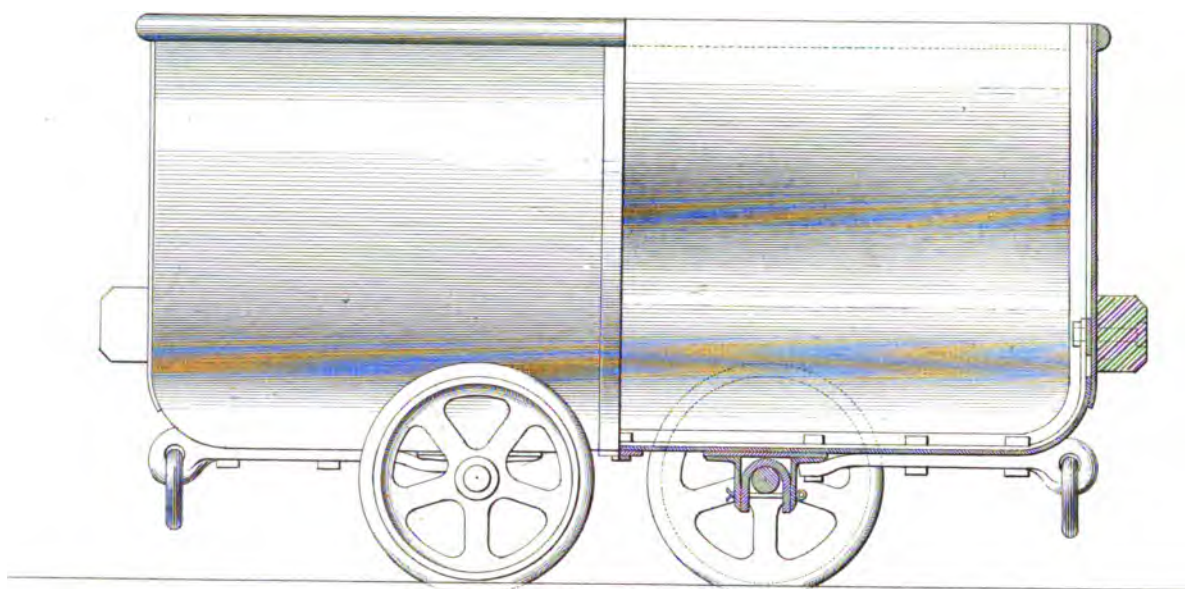
Ech. $\frac{1}{10}$.

Fig. 2.

BENNE ROULANTE DE LA CHAZOTTE.

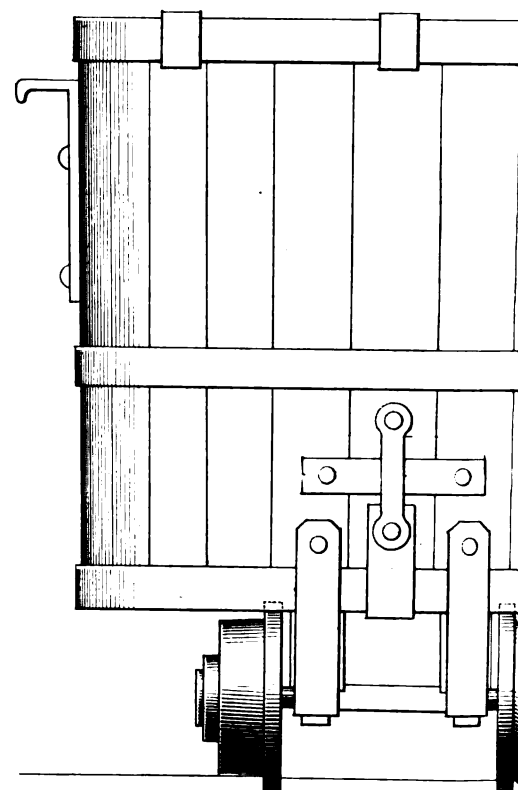
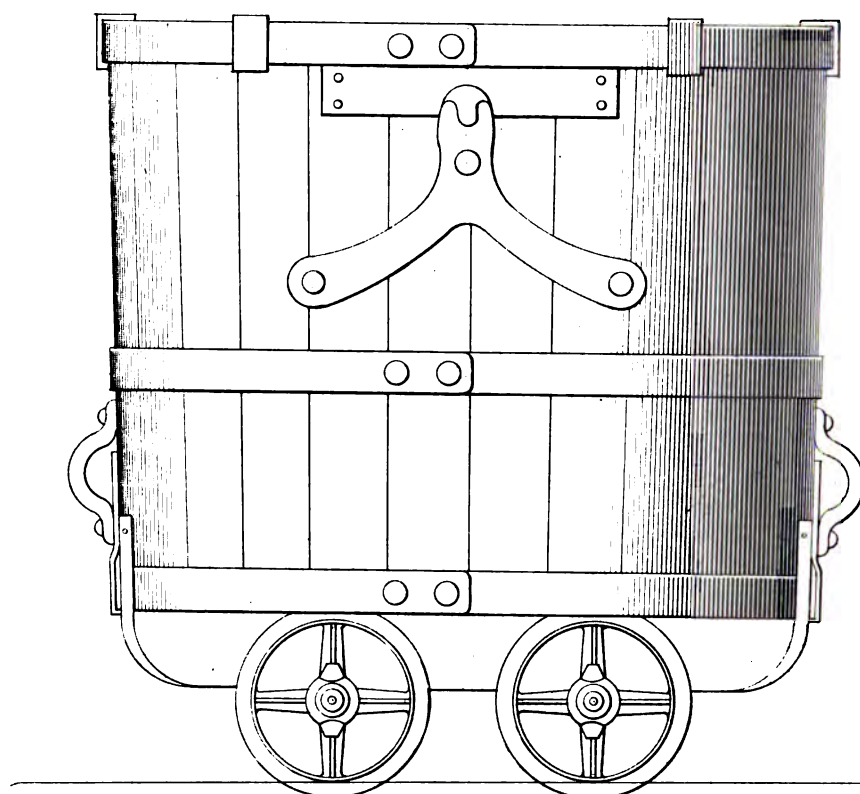
Ech. $\frac{1}{10}$.

Fig. 3. ROUE PAGAT.

Ech. $\frac{1}{4}$.

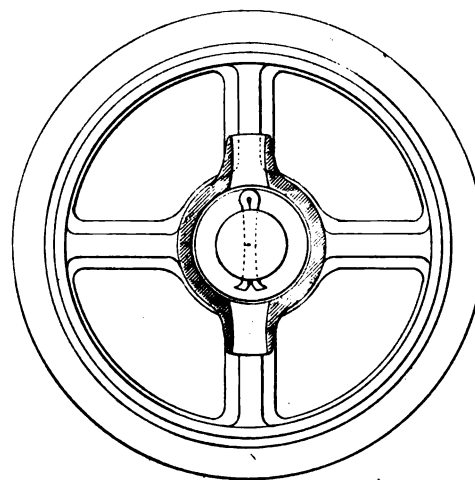
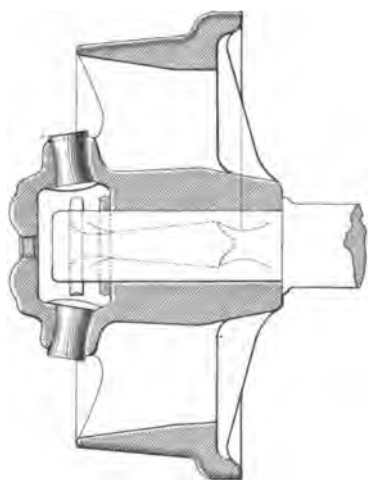
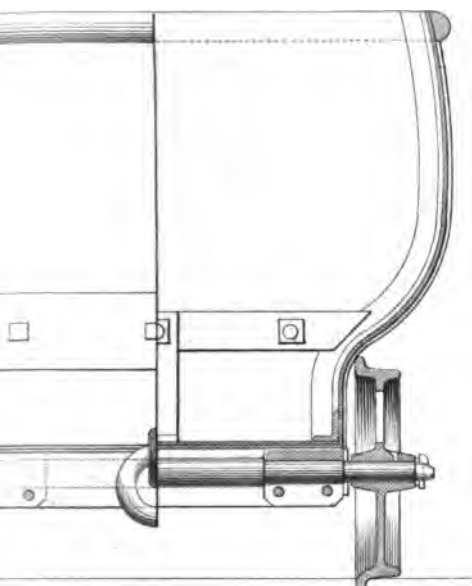
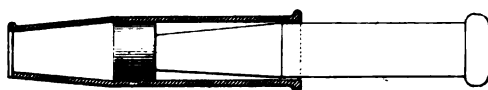


Fig. 4.



COMPRESSEUR POUR LES BOUCHONS DE LIÈGE.



Fig. 5.

BROUETTE FAGÈS, A BASCULE.

Ech. $\frac{1}{20}$.

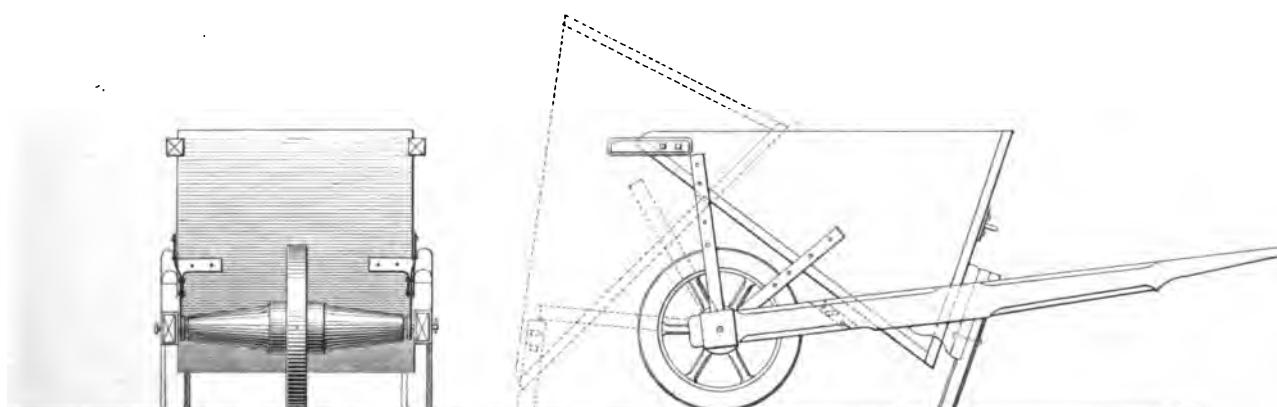


Fig. 1.
WAGON-BERLINE DE BLANZY.

Echelle $\frac{1}{50}$.

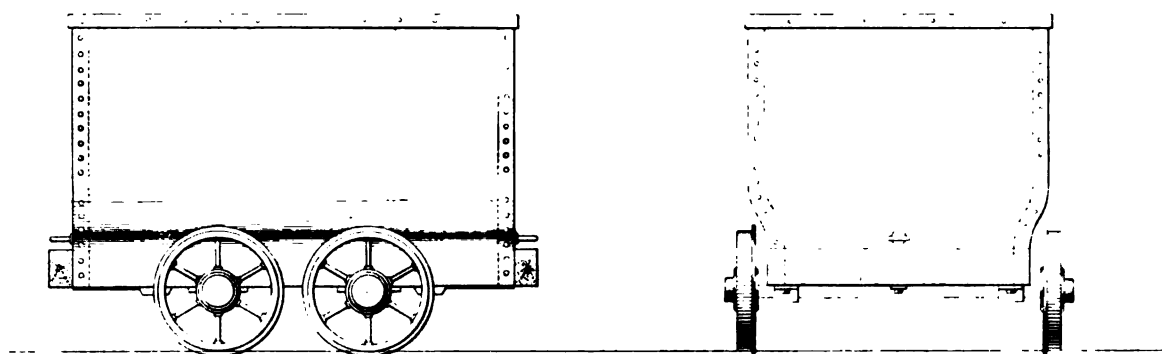
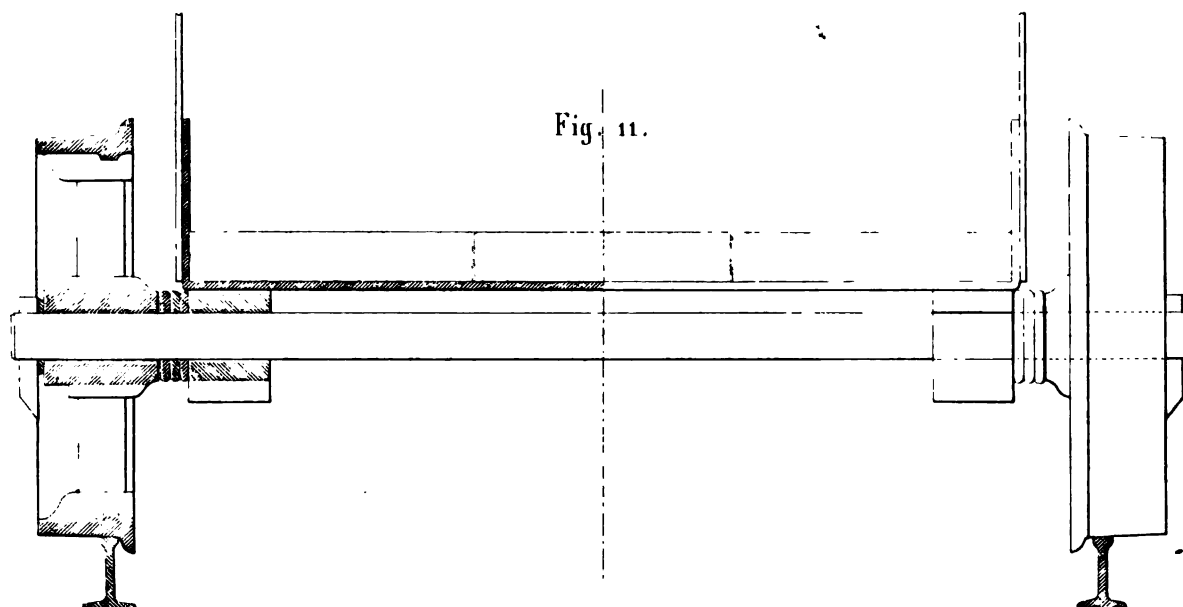


Fig. 11.



Détail des roues et des essieux.

Fig. 12.

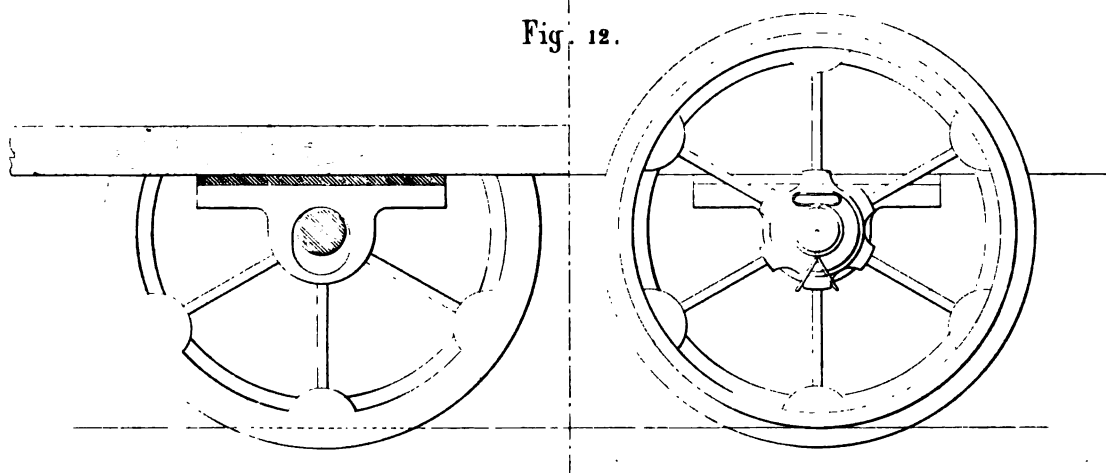


Fig. 3.

Fig. 4.

Fig. 2. CAGE AVEC PARACHUTE DE BLANZY.

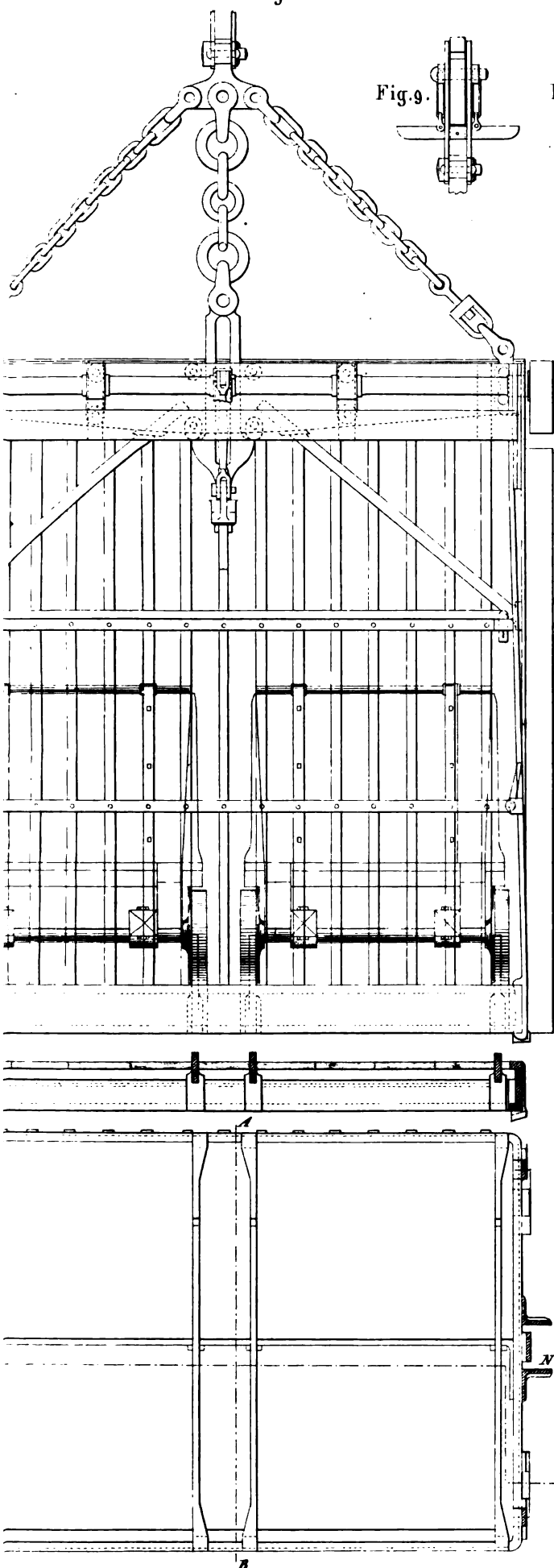


Fig. 9.

Fig. 10.

Fig. 5.

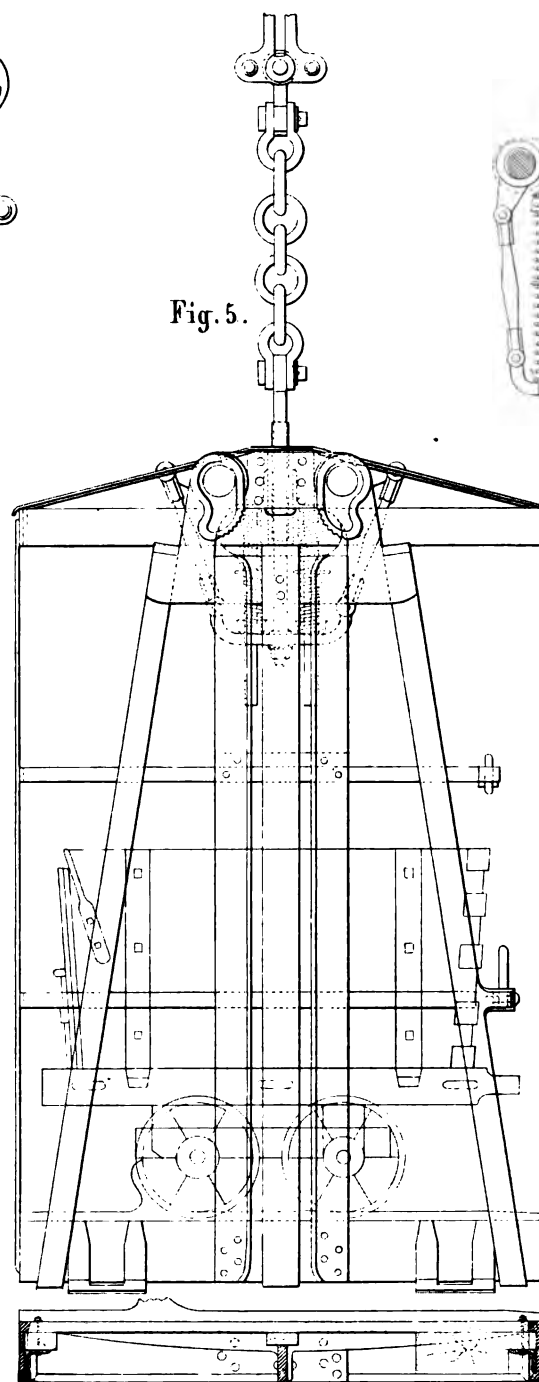
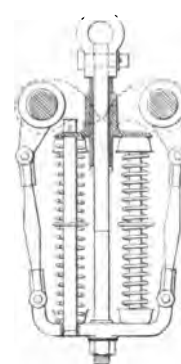


Fig. 8.



WAGON
A REMBLAI.

Fig. 6.

Fig. 7.

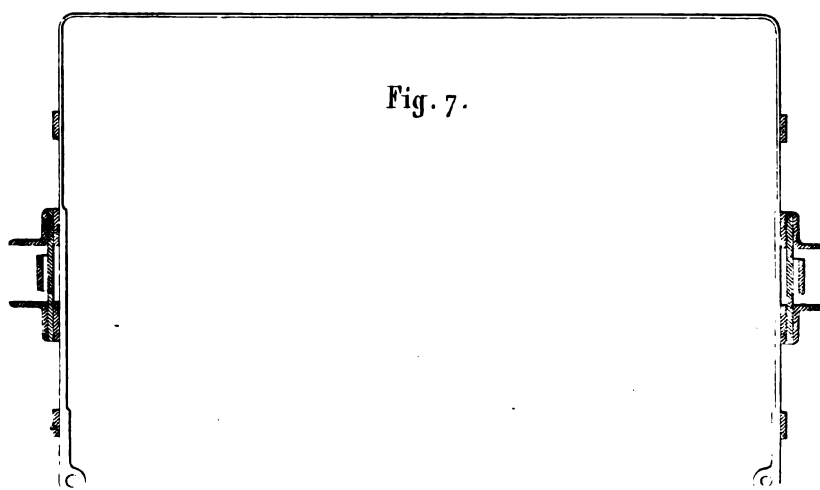


Fig. 1. POMPE POUR LA COMPRESSION DE L'AIR.

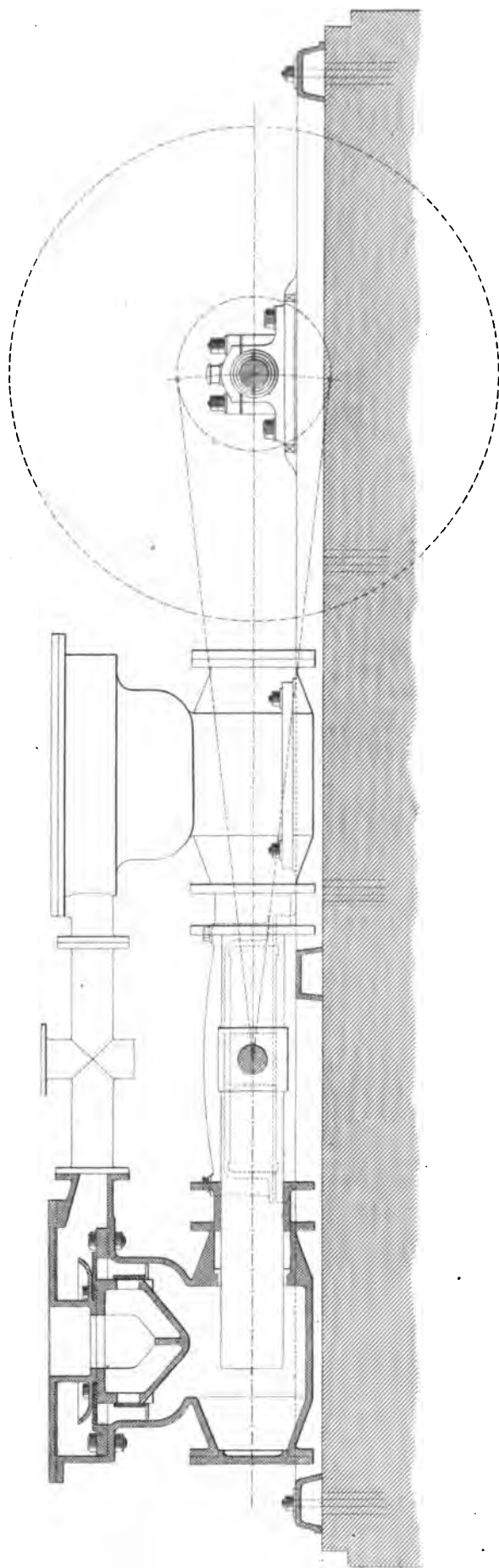
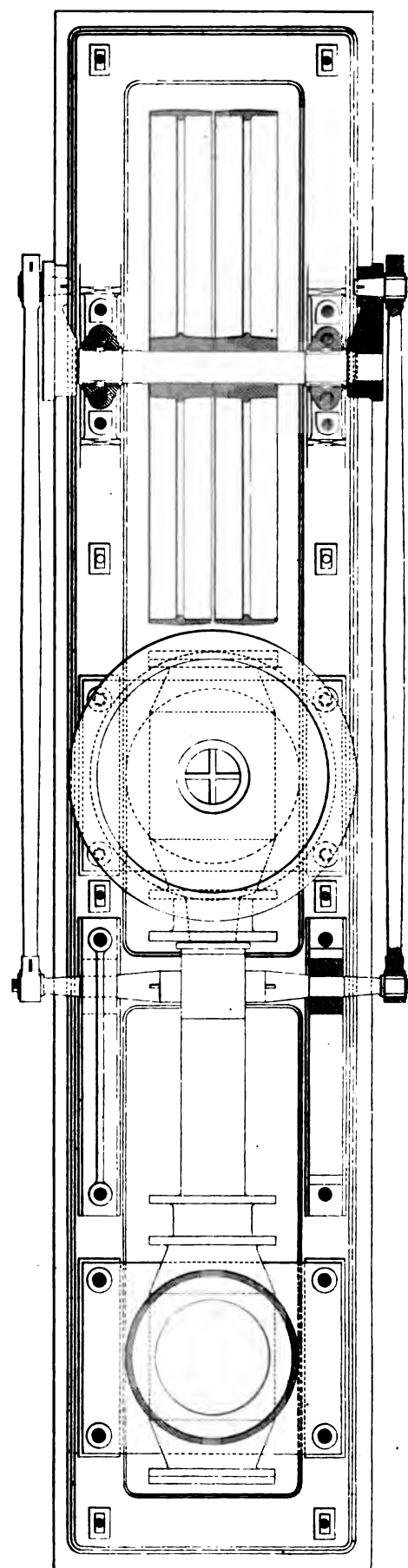


Fig. 2 PLAN D'UNE POMPE POUR LA COMPRESSION DE L'AIR.



Coupe longitudinale
du cylindre moteur
à air comprimé.

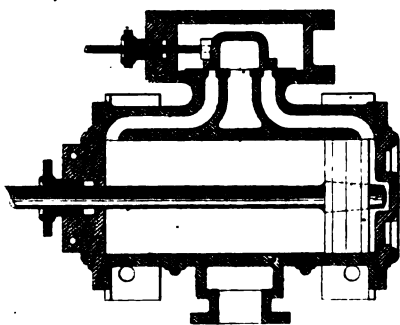


Fig. 6.

Coupe transversale
du cylindre moteur
à air comprimé

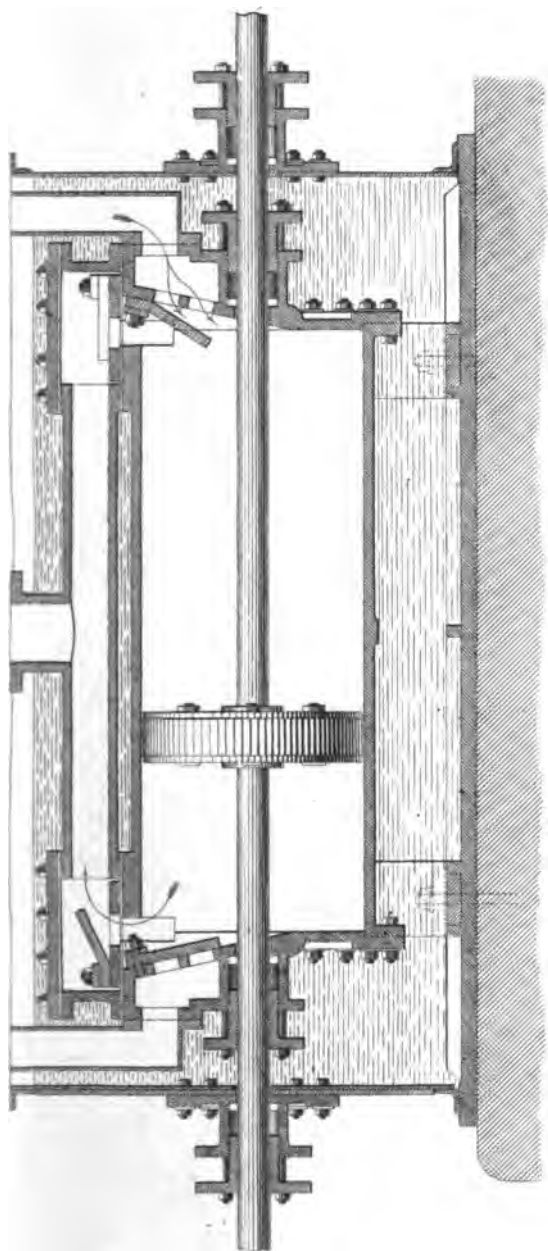
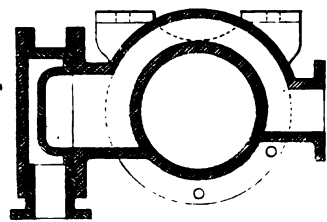
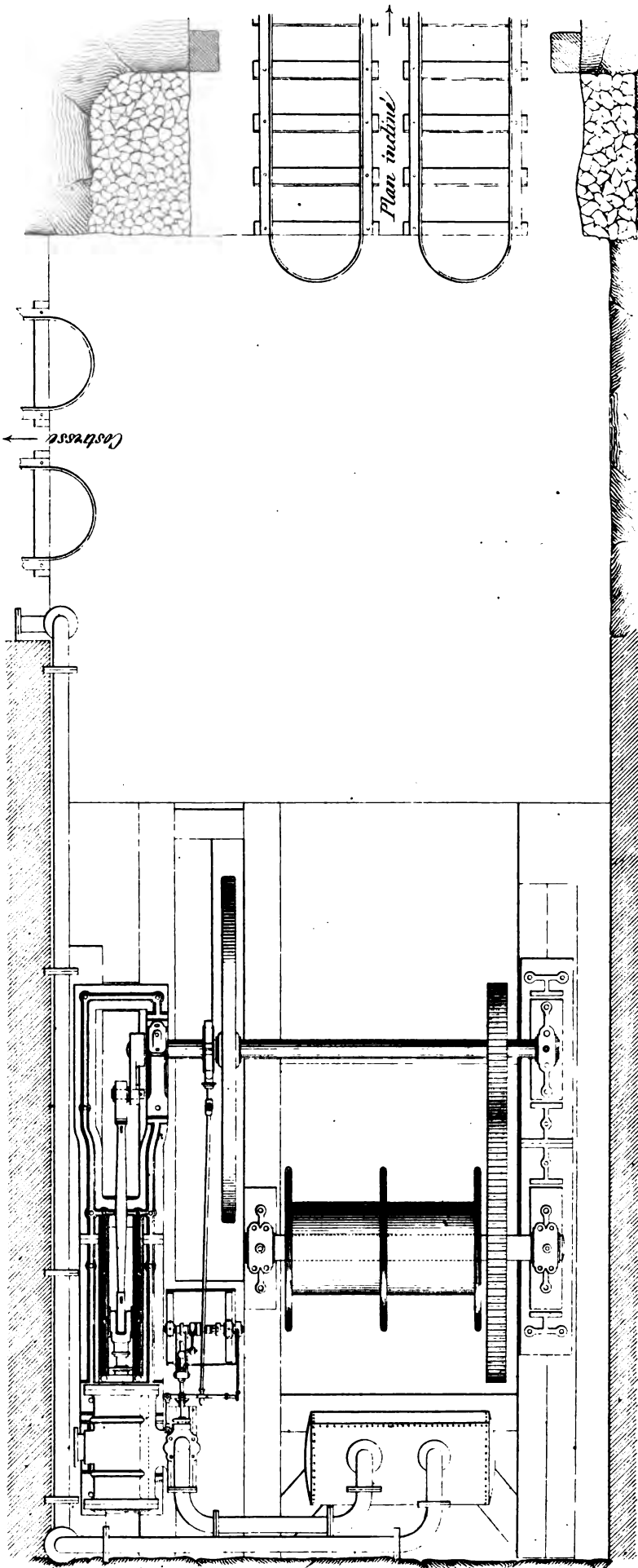


Fig. 4. MACHINE A AIR COMPRIMÉ DE SARS-LONCHAMPS.



CAGE ET PARACHUTE
à CONSTANTIN
(RUHR.)

Fig. 1.
Élévation.

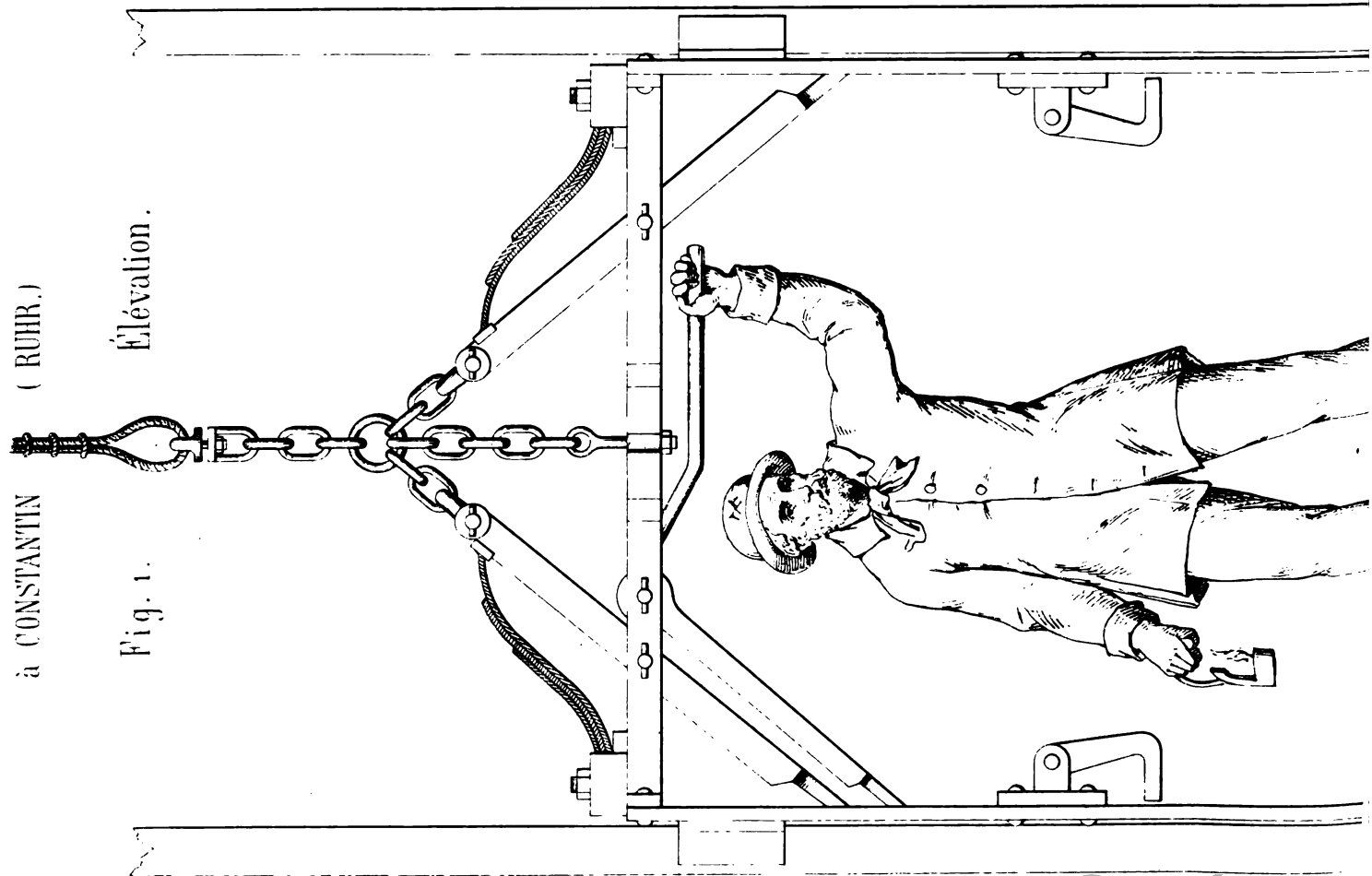


Fig. 4.

TAMBOUR SPIRALE DU PUTTS SKALLEY.

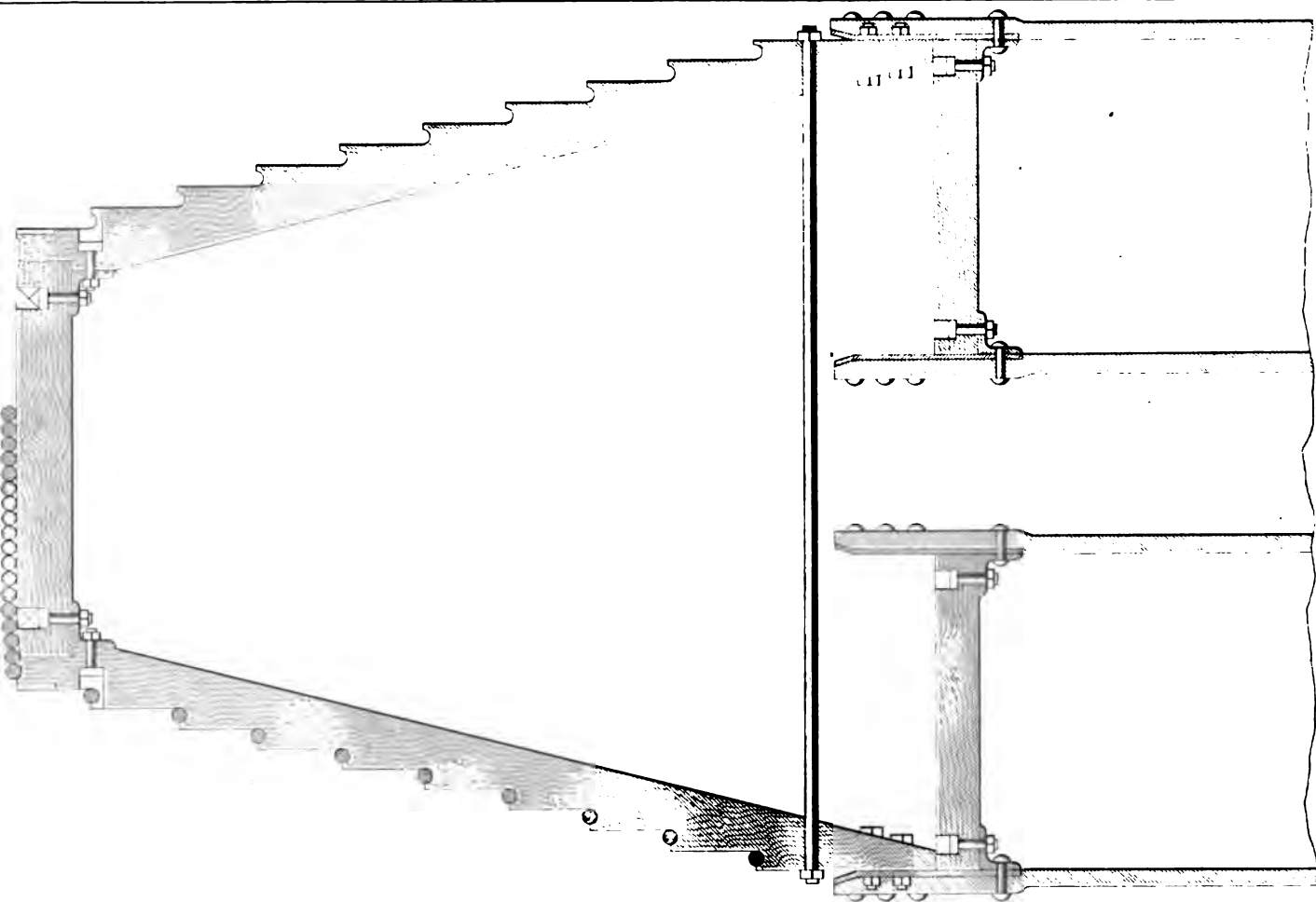


Fig. 5. Plan de l'enroulement.

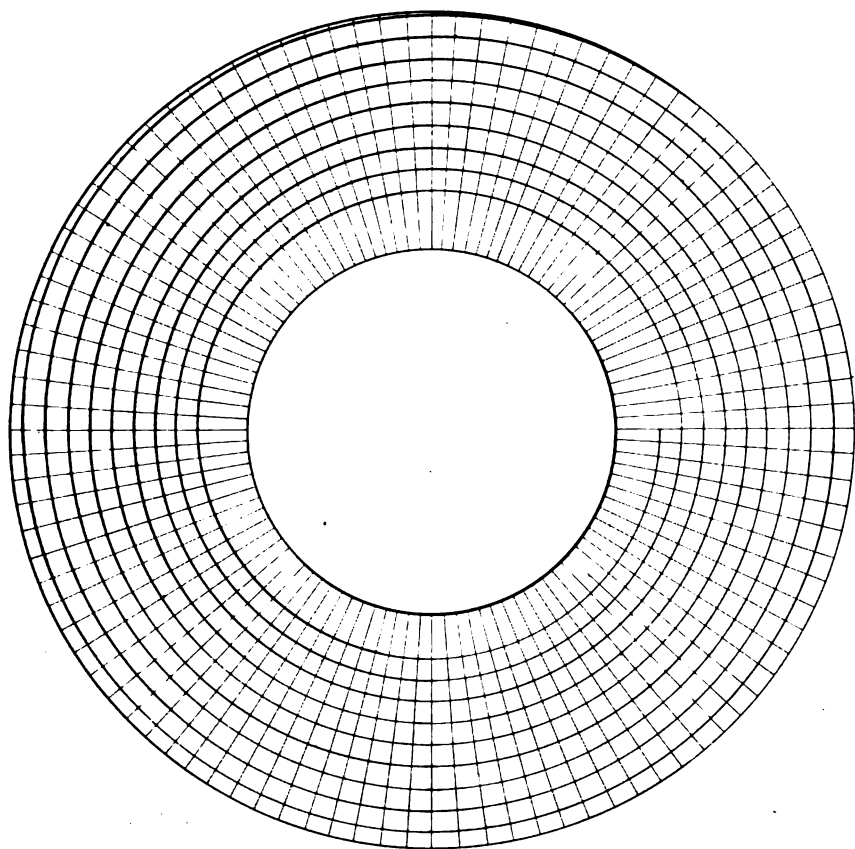


Fig. 2. Guide des griffes.

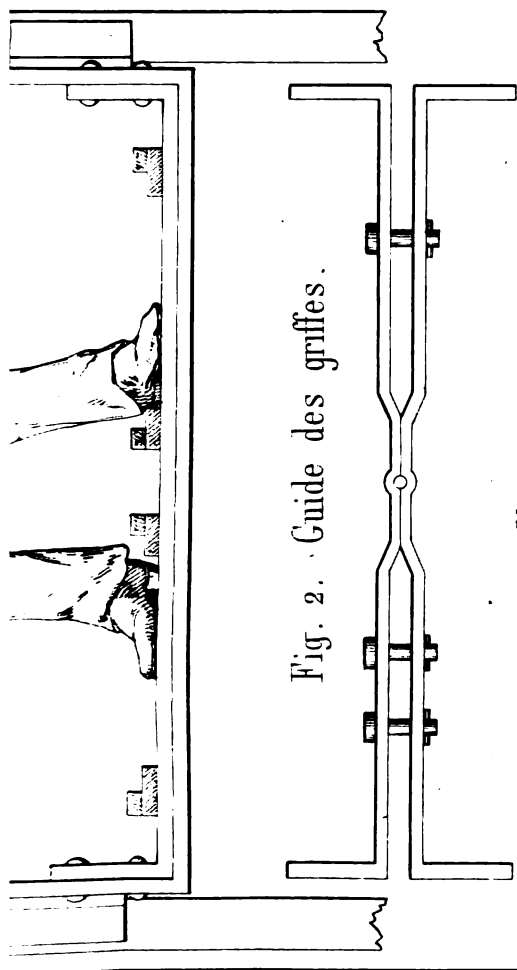


Fig. 3.

Parachute
FONTAINE.

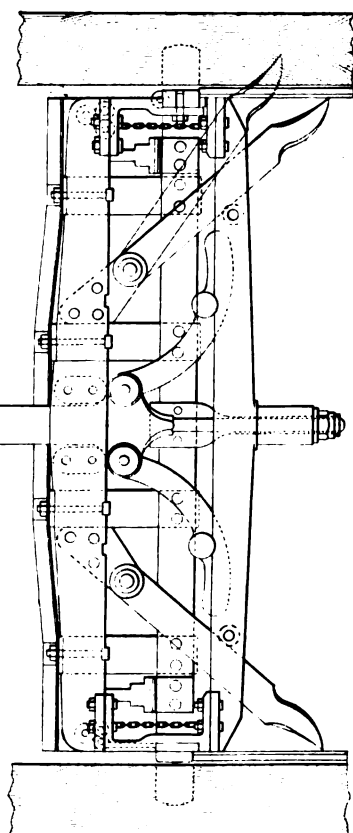


Fig. 6. Tambour spirale.

Ech. 1/500.

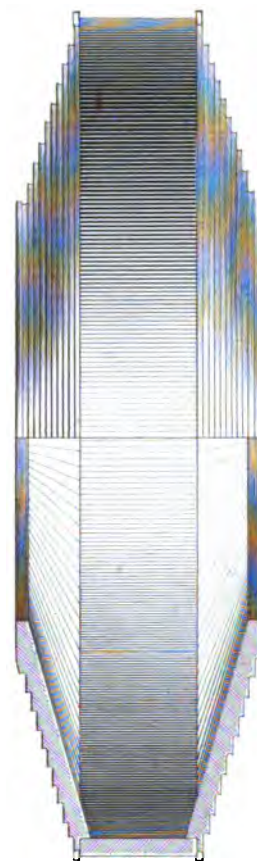
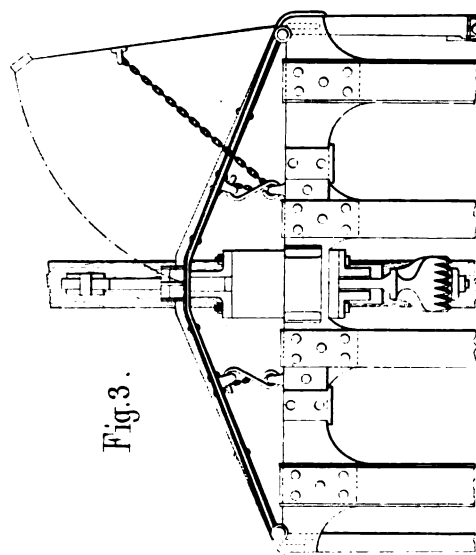


Fig. 3.



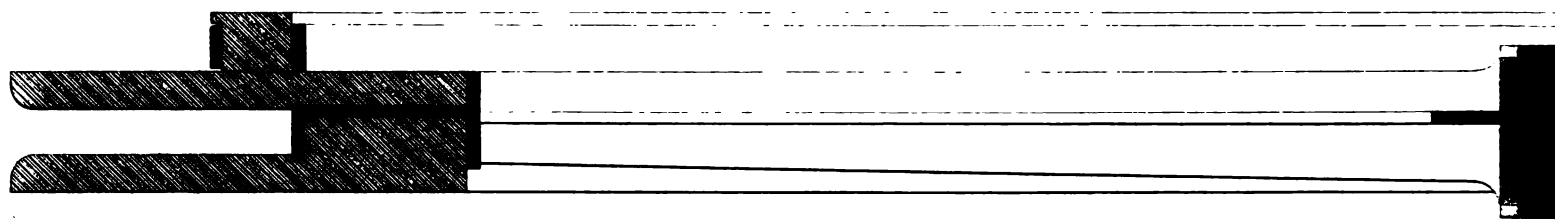
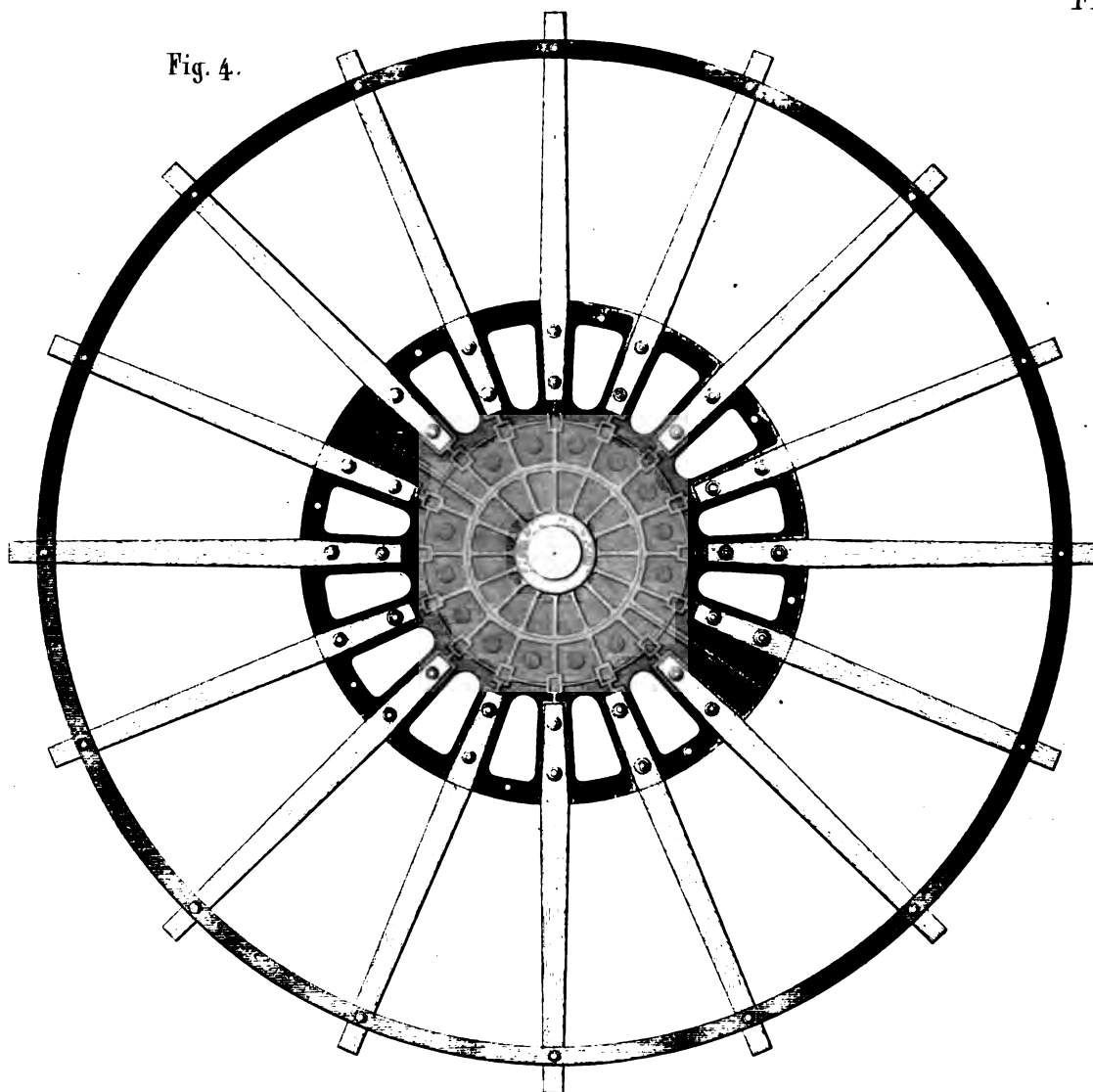


Fig. 1. BOBINE

Fig. 4.

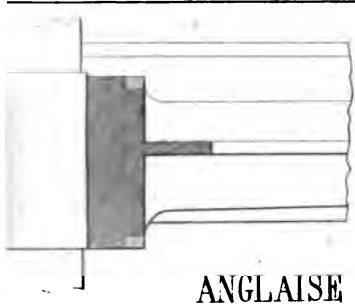


BOBINE FOLLE DU CREUSOT.

Echelle 0,02.



Fig. 5.



échelle 0,025

Fig. 2.
Jante
entre deux
rayons.

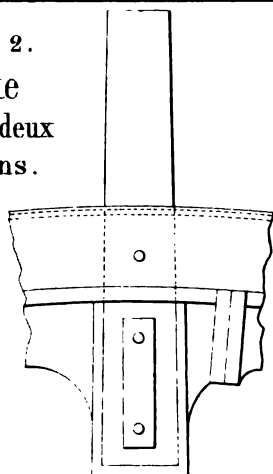


Fig. 3.
Jante.

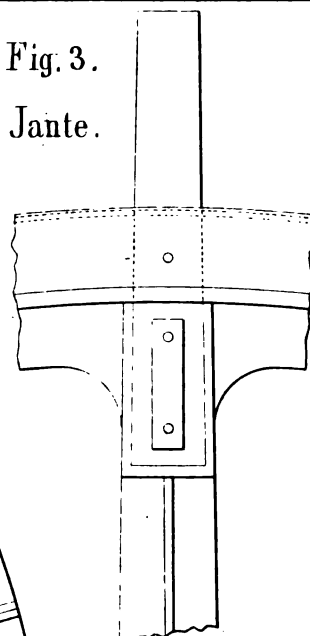


Fig. 6.

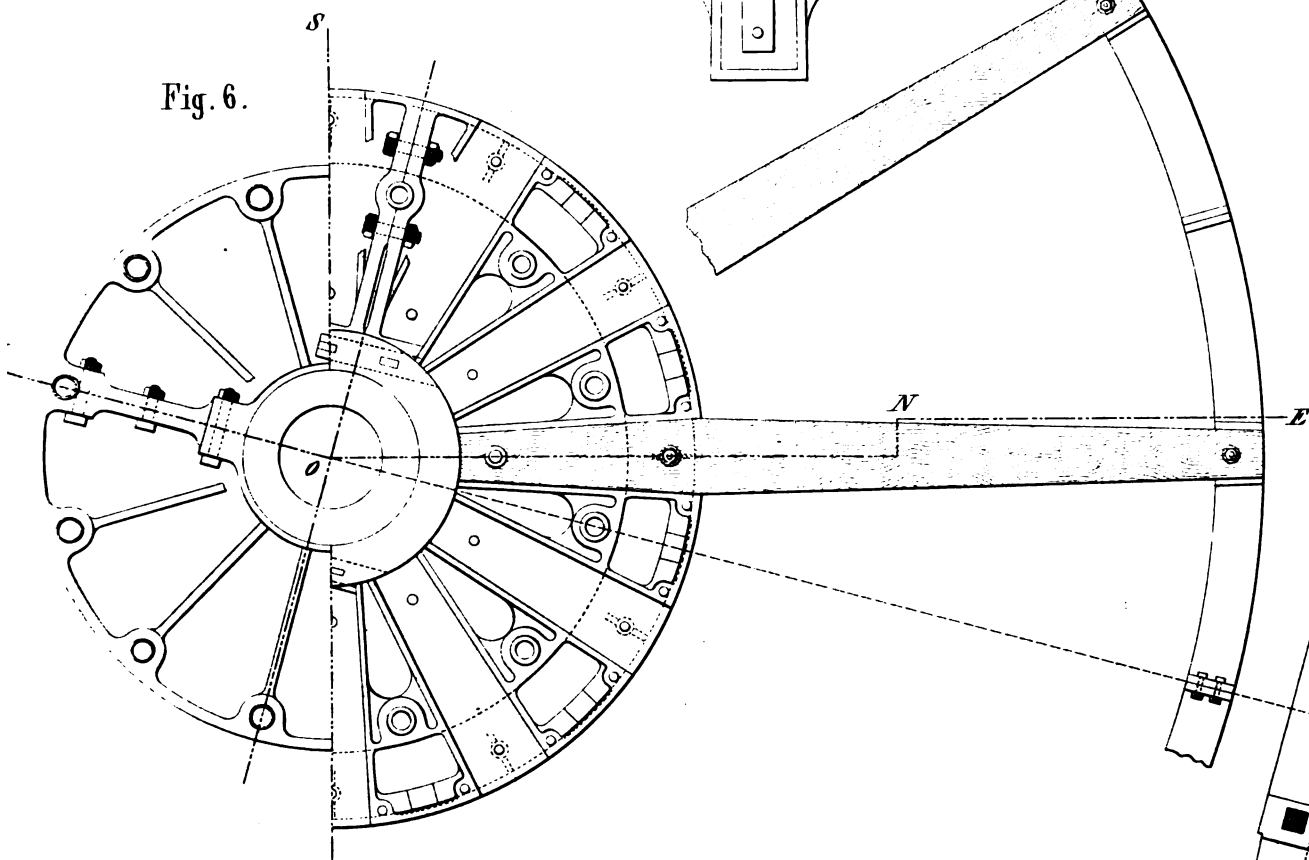
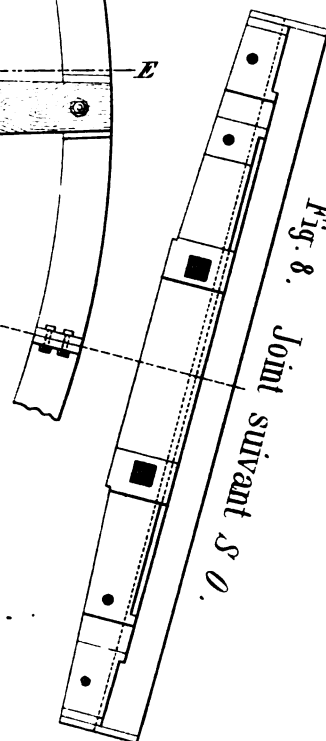


Fig. 8. Joint suivant *S O*.



BOBINE FOLLE DE MONTCEAU LES MINES.

Echelle 0,05.

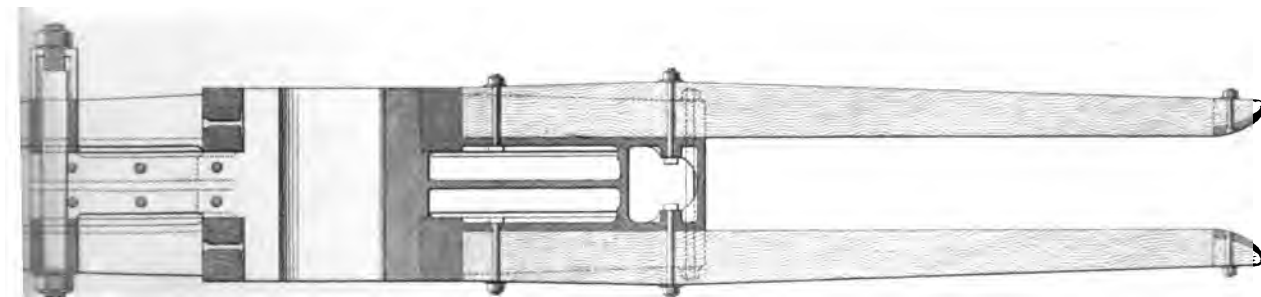
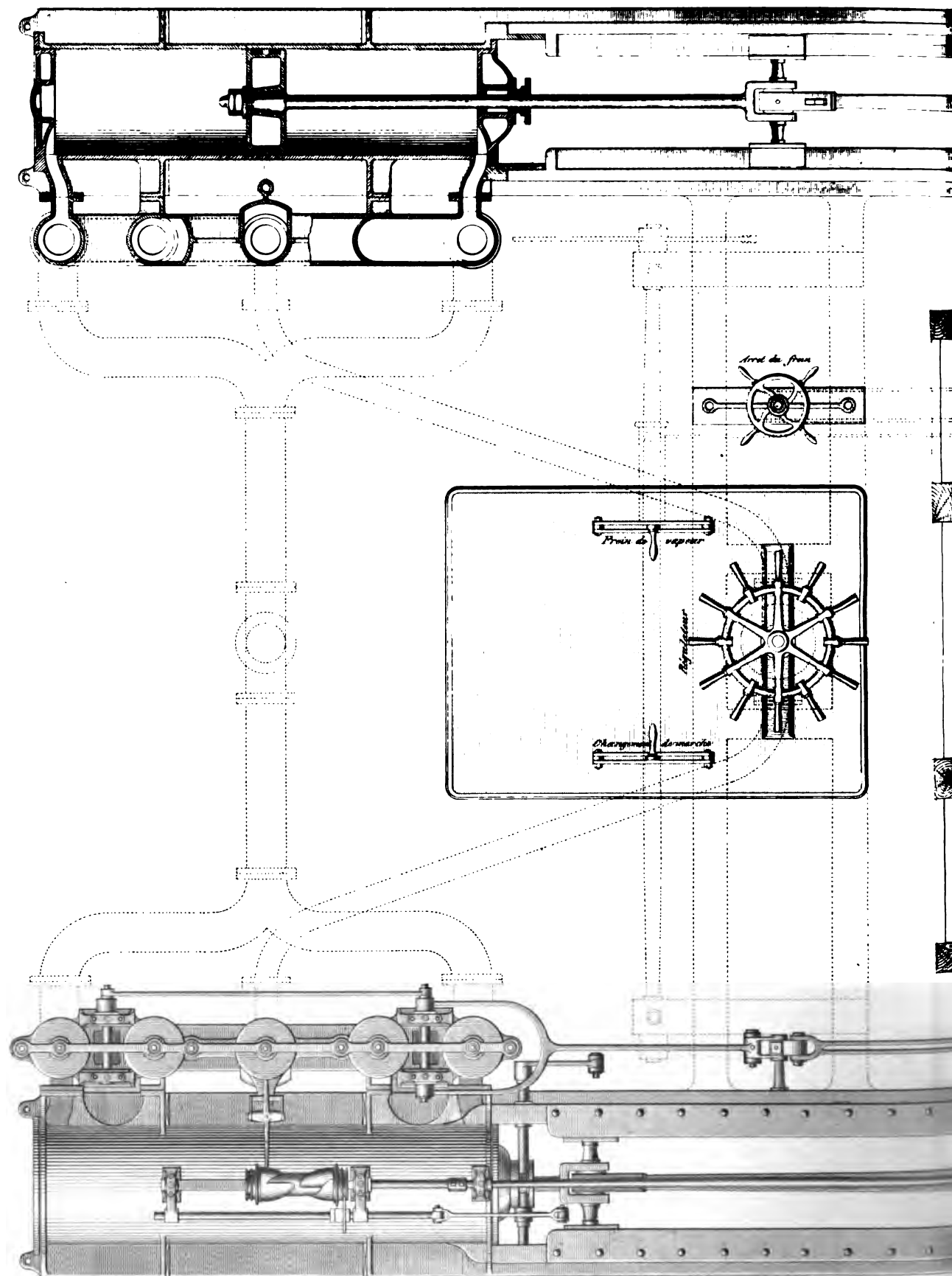
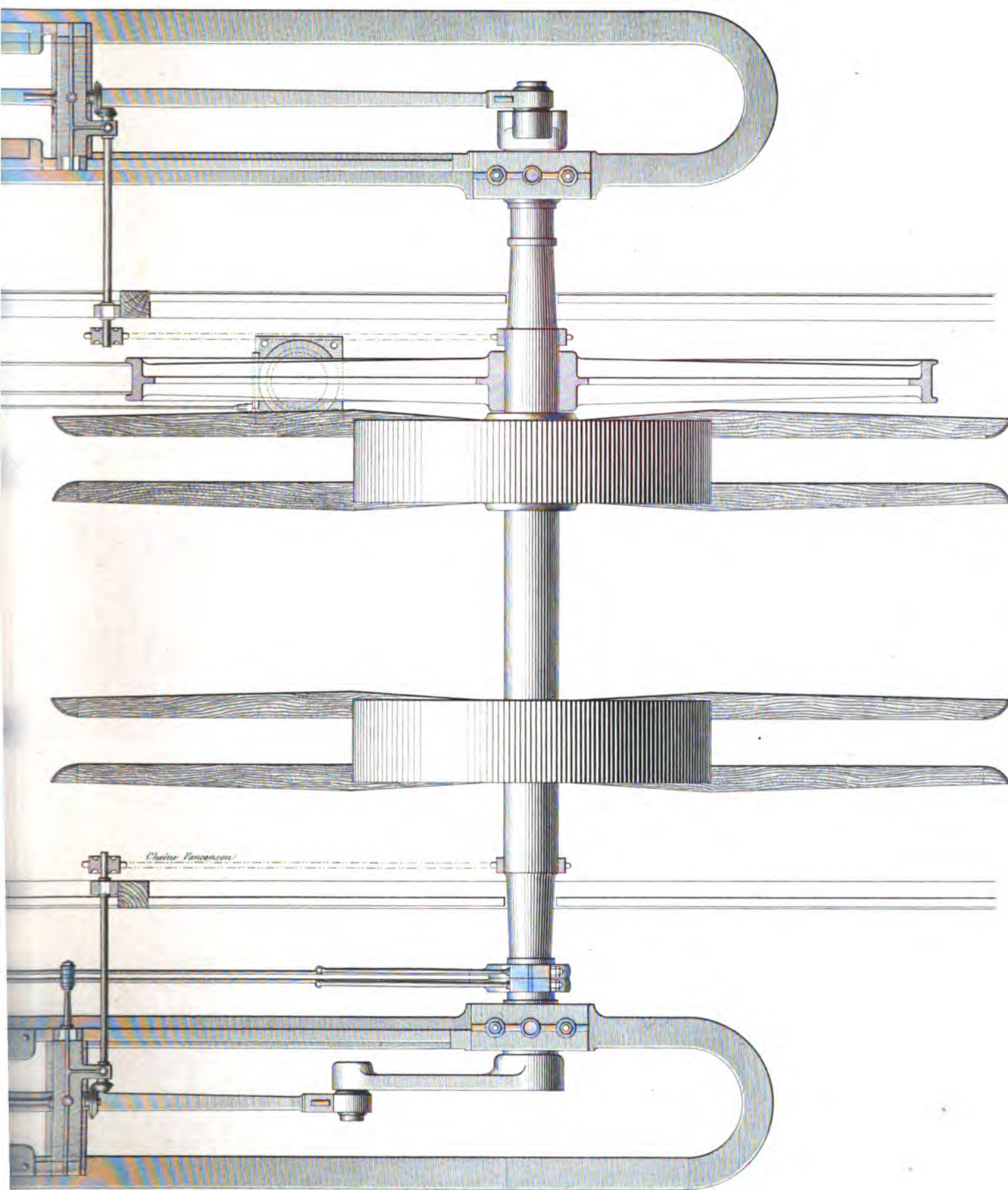
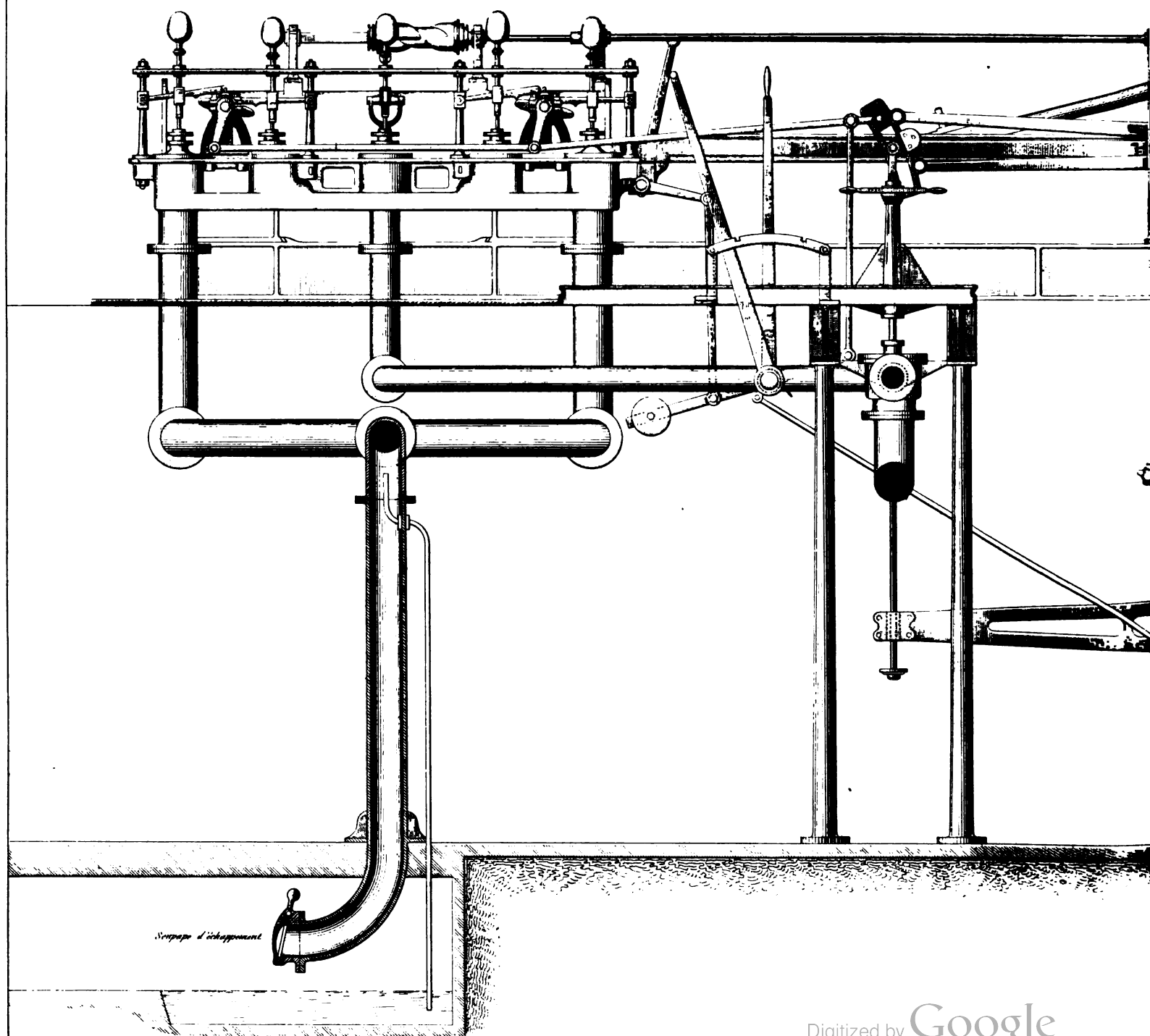
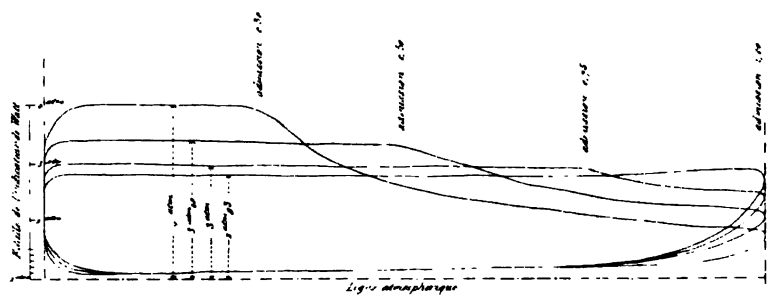


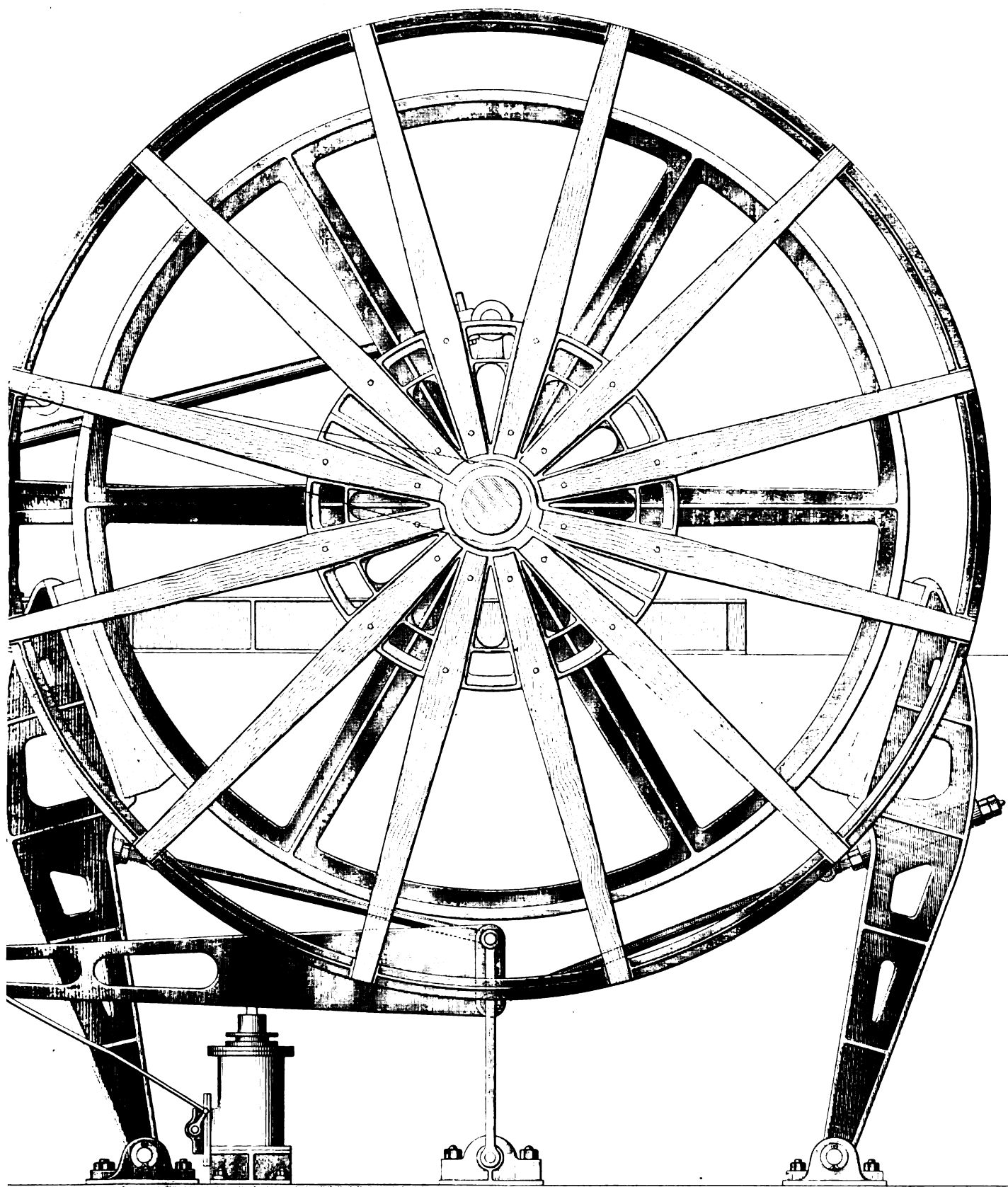
Fig. 7. Coupe suivant *M O N E*.



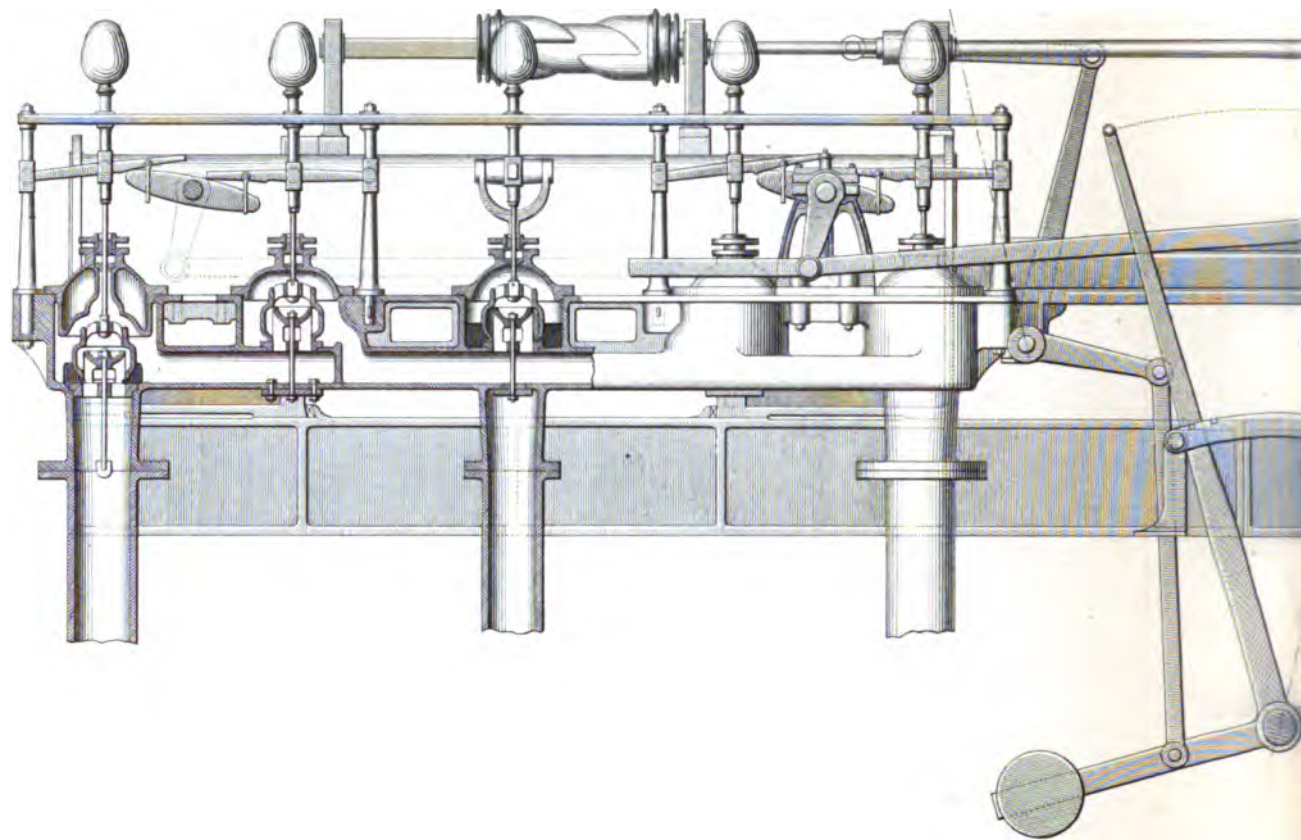


Diagrammes.

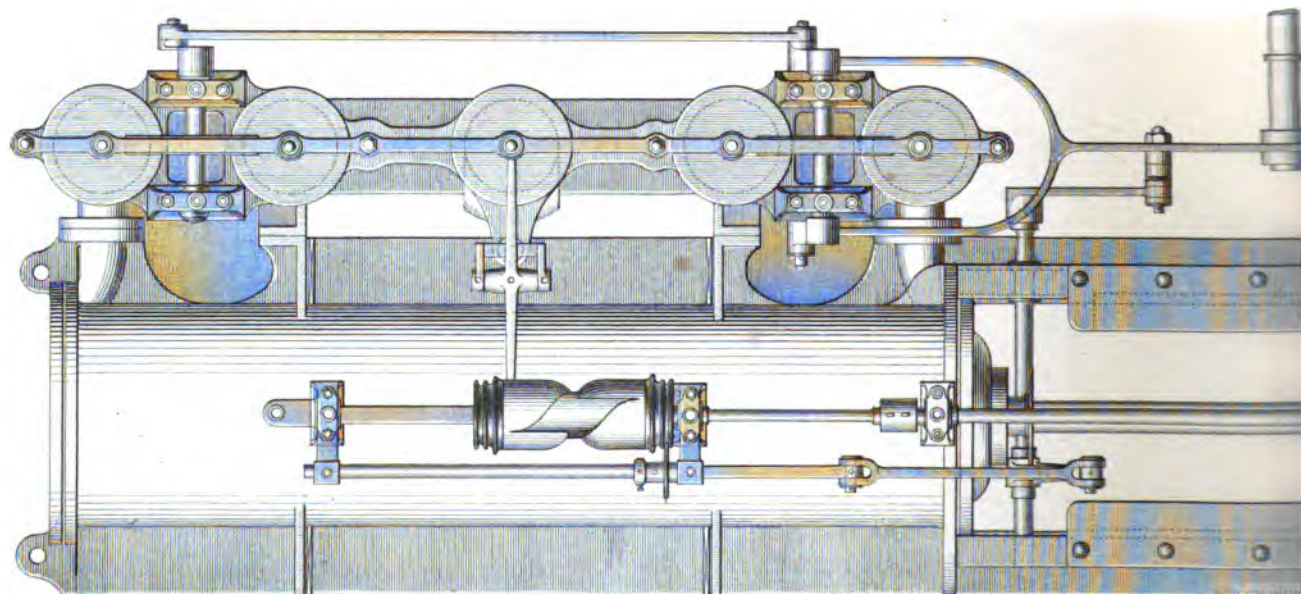




COUPE ET ÉLÉVATION DE LA DISTRIBUTION A DÉTENTE VARIABLE

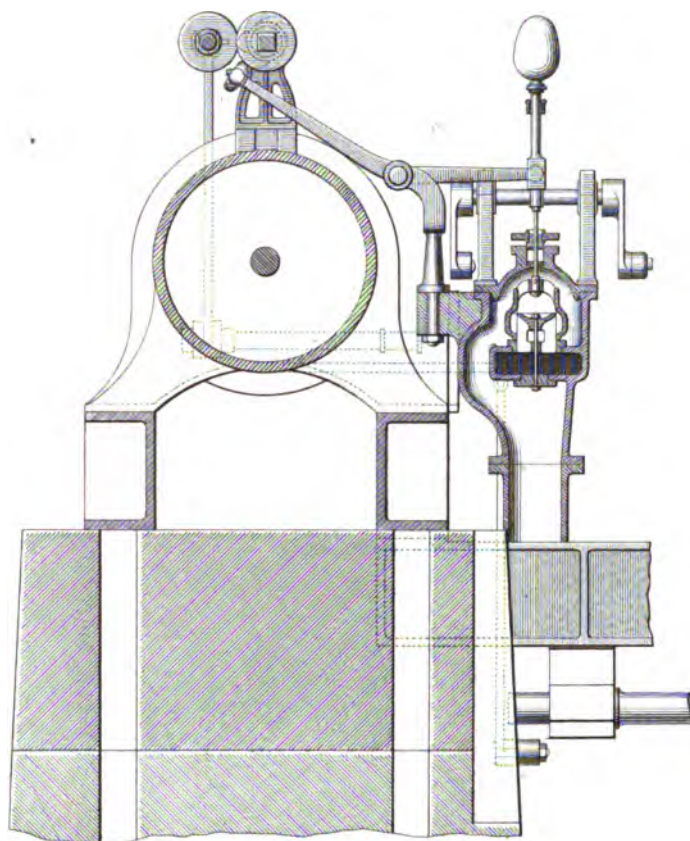
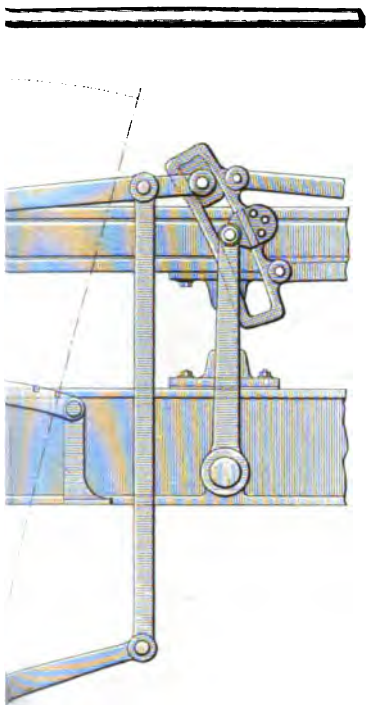


PLAN D'UN CYLINDRE AVEC LA DISTRIBUTION A DÉTENTE VARIABLE



LE.

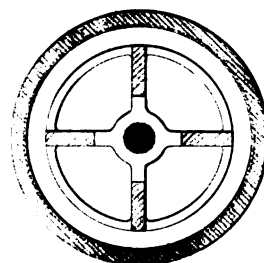
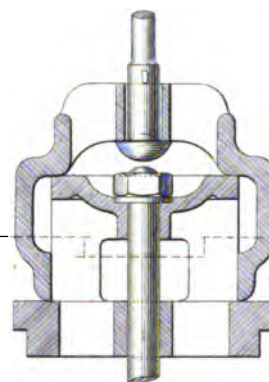
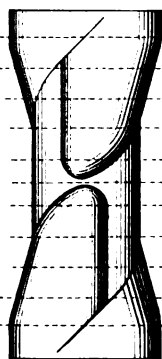
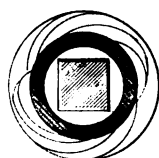
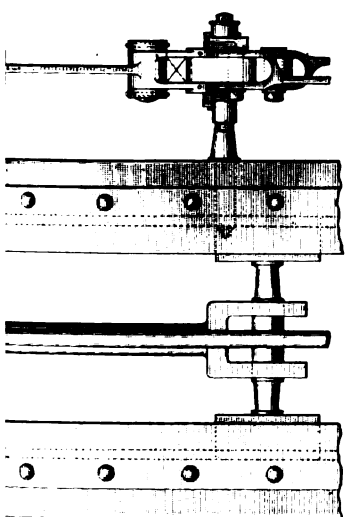
COUPE D'UN CYLINDRE
PAR LA SOUPE DE DÉTENTE.



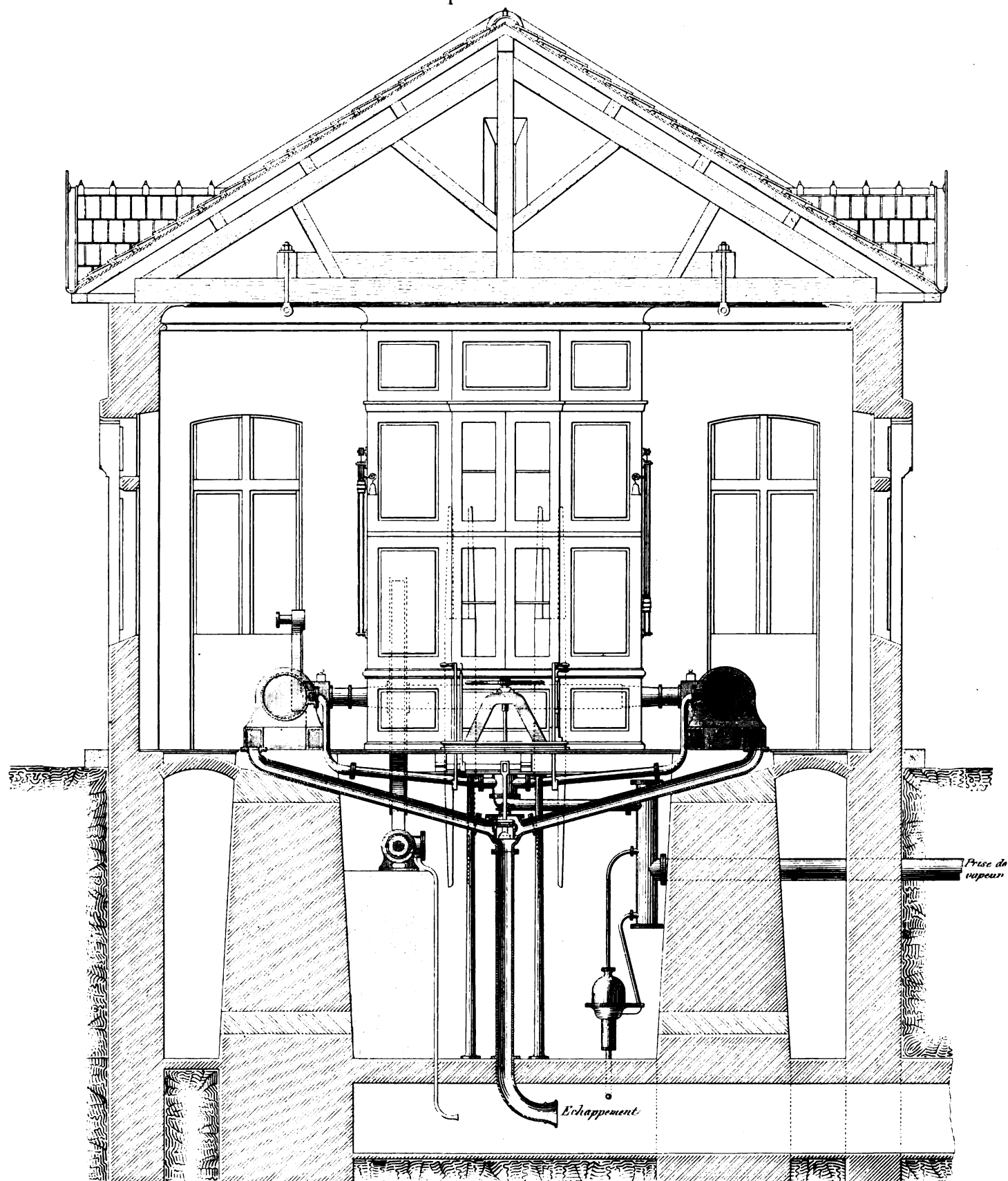
BLE.

SOUPE DE DÉTENTE.

MANCHON MOBILE POUR
LA DÉTENTE VARIABLE.

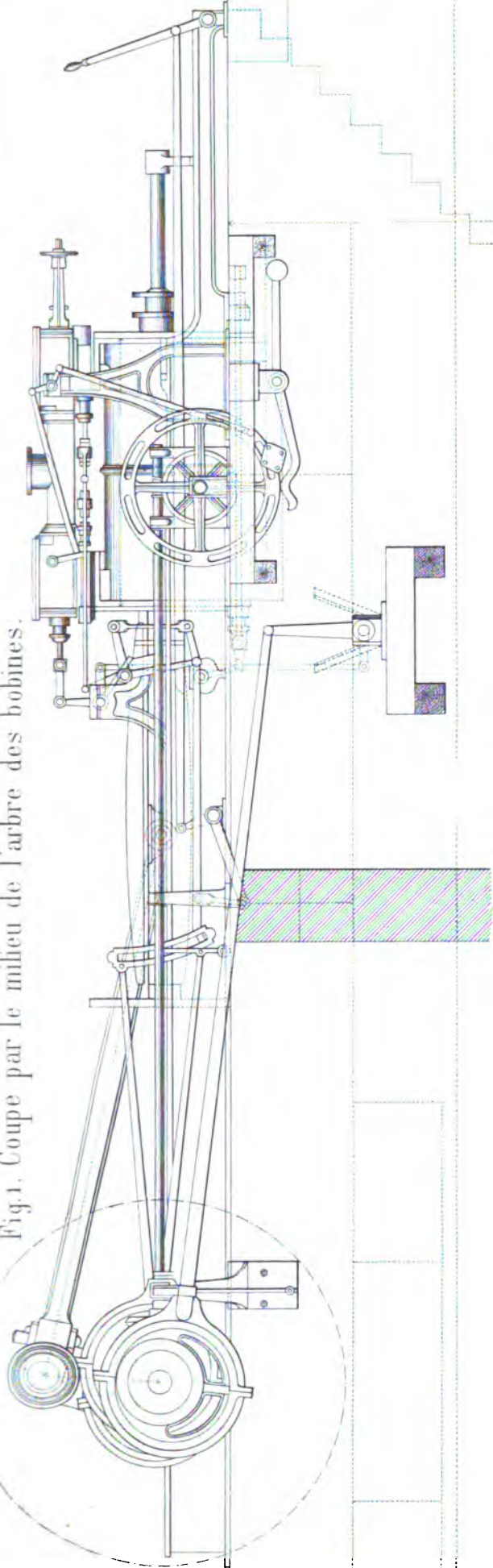
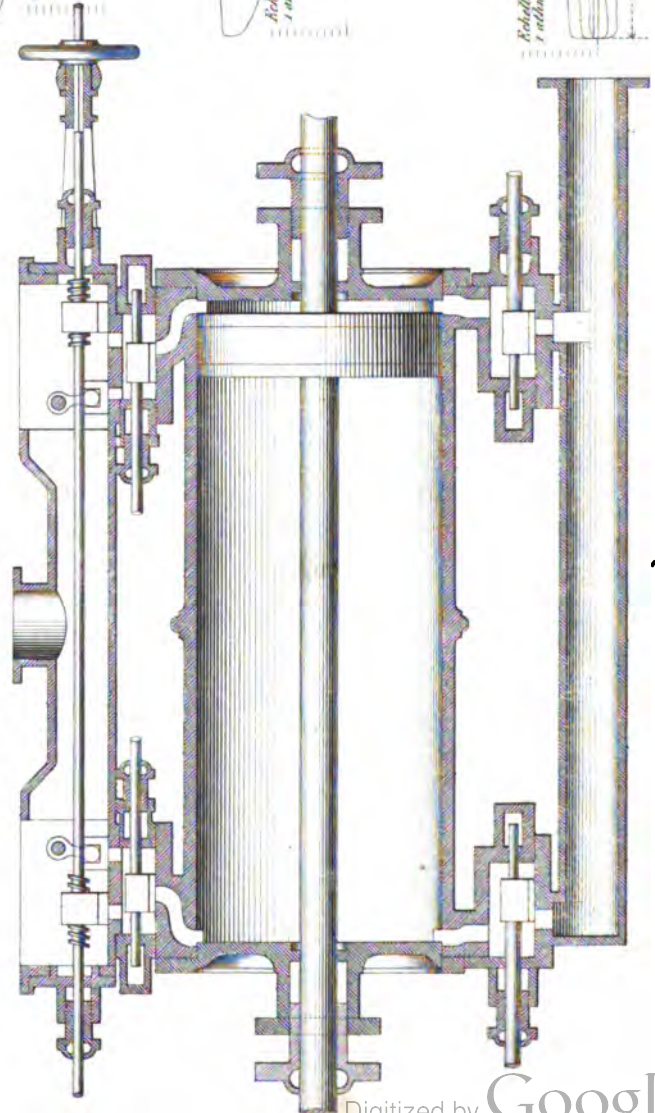


MACHINE D'EXTRACTION. Puits du MAGNY, N° 2.
Coupe transversale.



Echelle : 0,015 pour mètre.

Fig. 1. Coupe par le milieu de l'arbre des bobines.

Fig. 2.
Coupe longitudinale d'un cylindre.

Diagrammes.

Fig. 3. Marche sans détente. Grande vitesse.



Fig. 4. Marche sans détente. Vitesse moyenne.



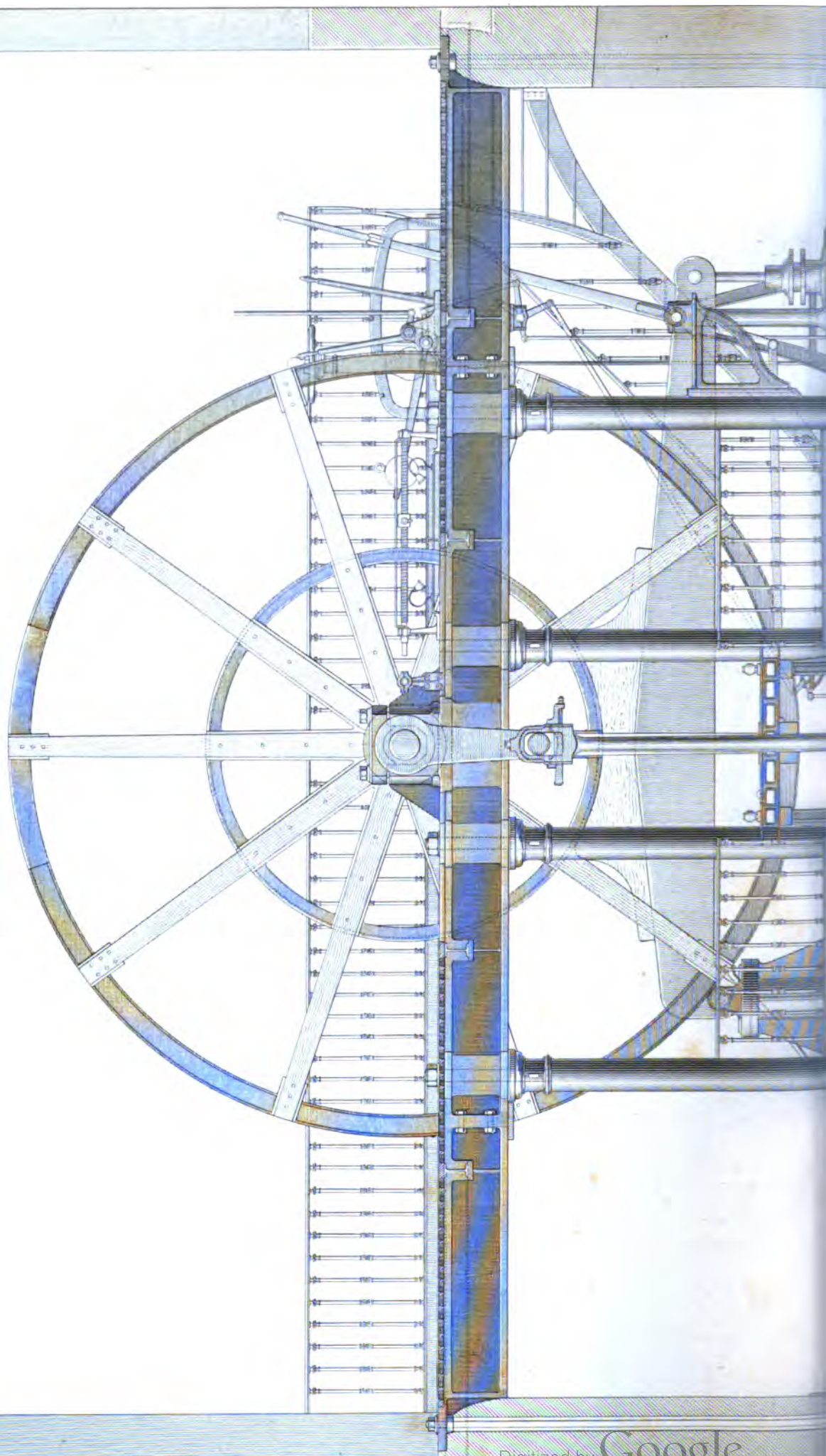
Fig. 5. Marche avec détente.

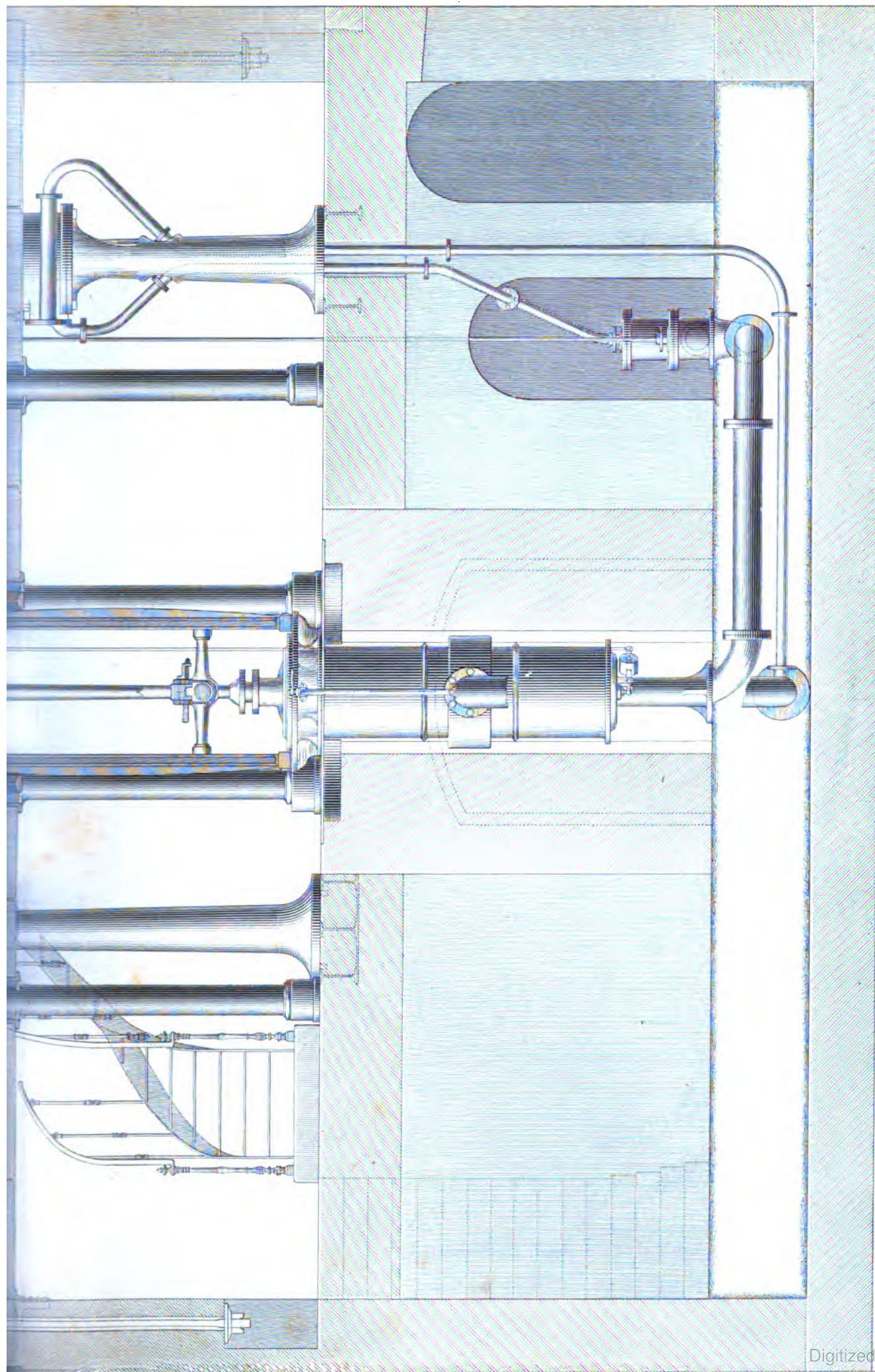


MACHINE D'EXTRACTION DU PUIT MONTRERAD A FIRMINY.

Par M^{rs} REVOLLIER BETHIX et C^{ms}.

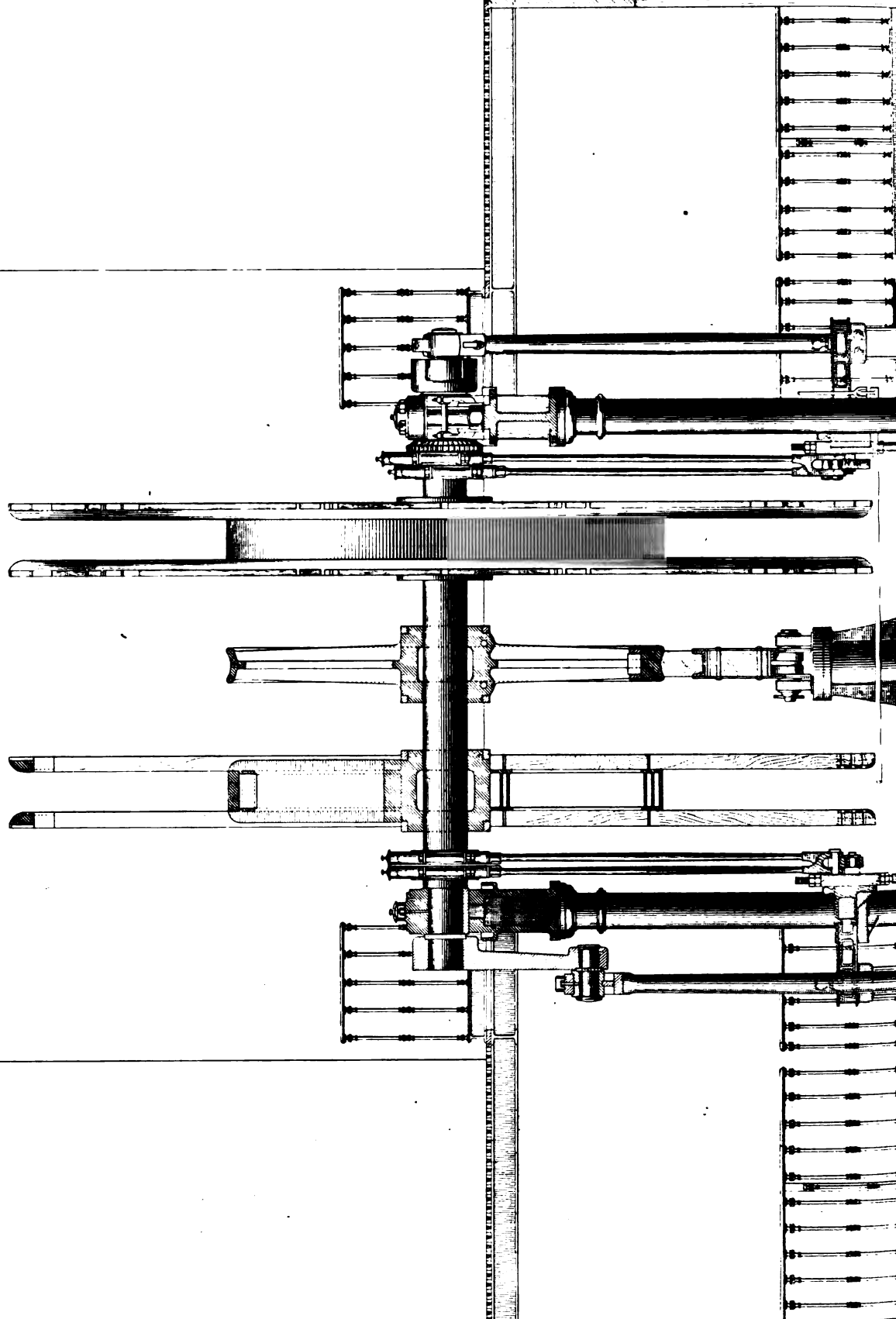
Modèle en 1/25 pour 2 mètres.

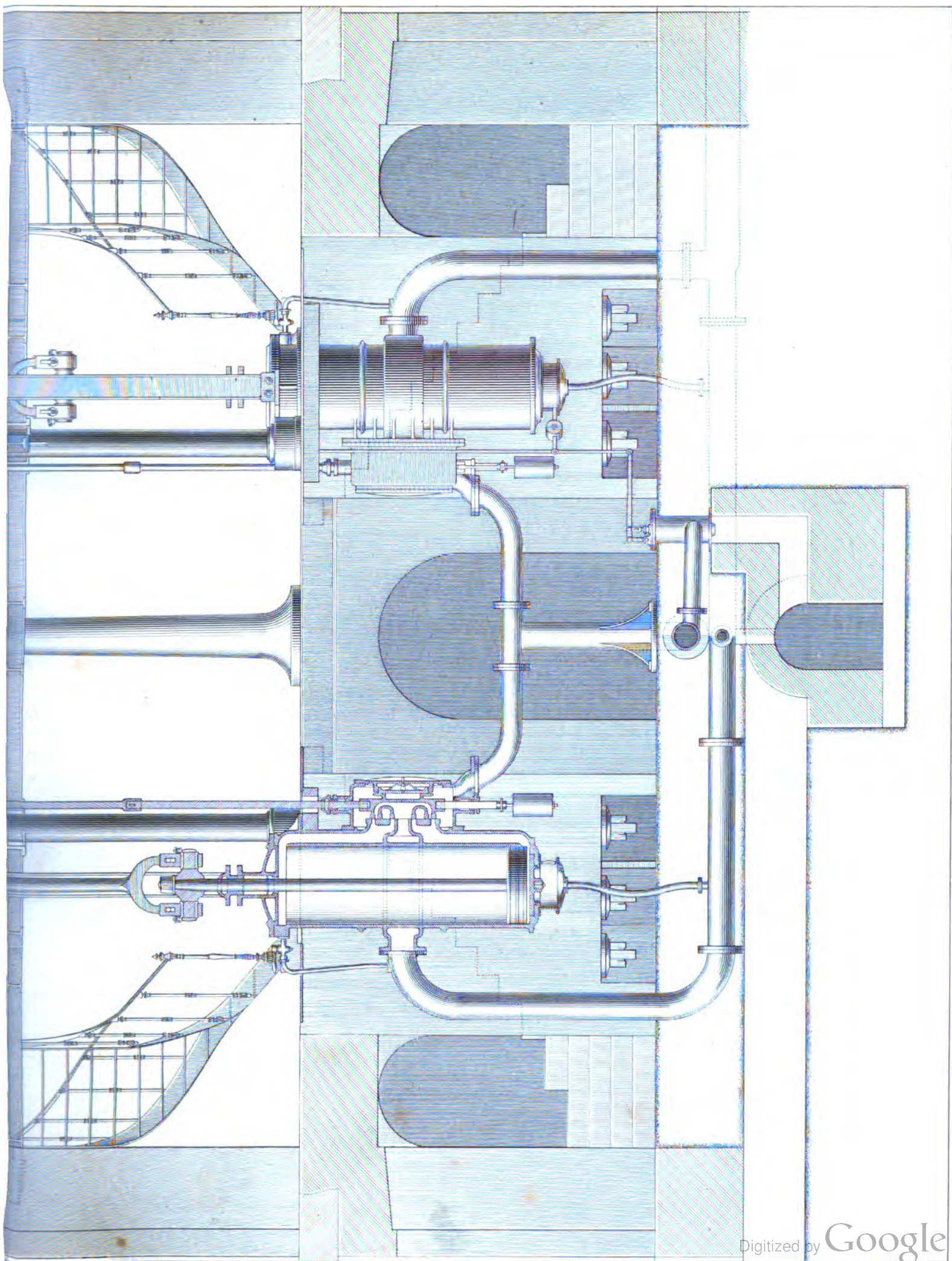




Projet de pompe de M. Baudry, à Liège.

MACHINE D'EXTRACTION DU PUIT'S MONTERRAD A FIRMINY.

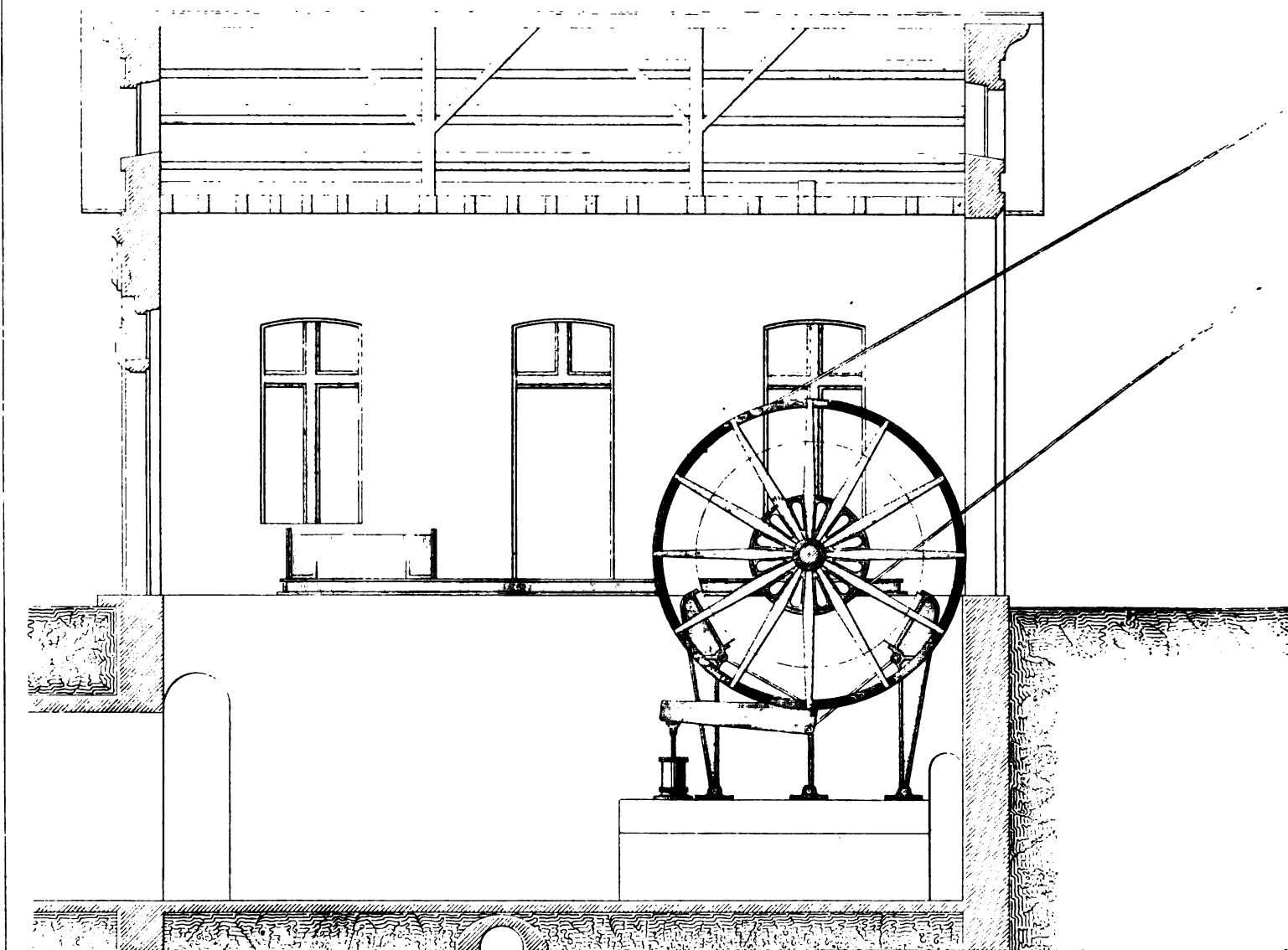
Par M^{RS} REVOLLIER, BIETRIX et C^{IE}*Echelle : 0,025 pour 1 mètre.*



PUITS DU MAGNY N° 2, A MONTCEAU LES MINES

Coupe longitudinale.

Echelle $\frac{1}{100}$.



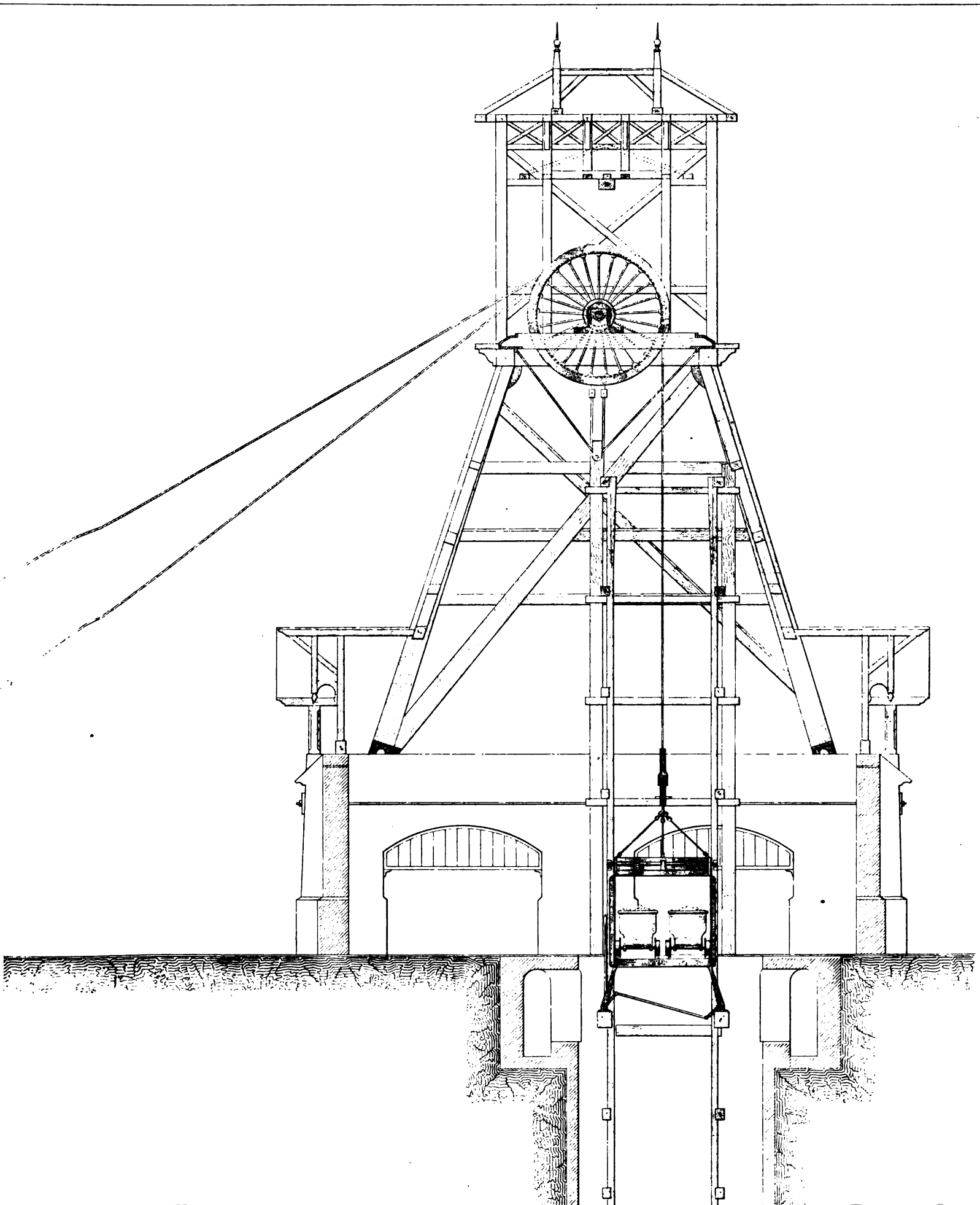


Fig. 1. Tiges de pompe en fer de Gewalt. (Ruhr.)

Ech. 1/10.

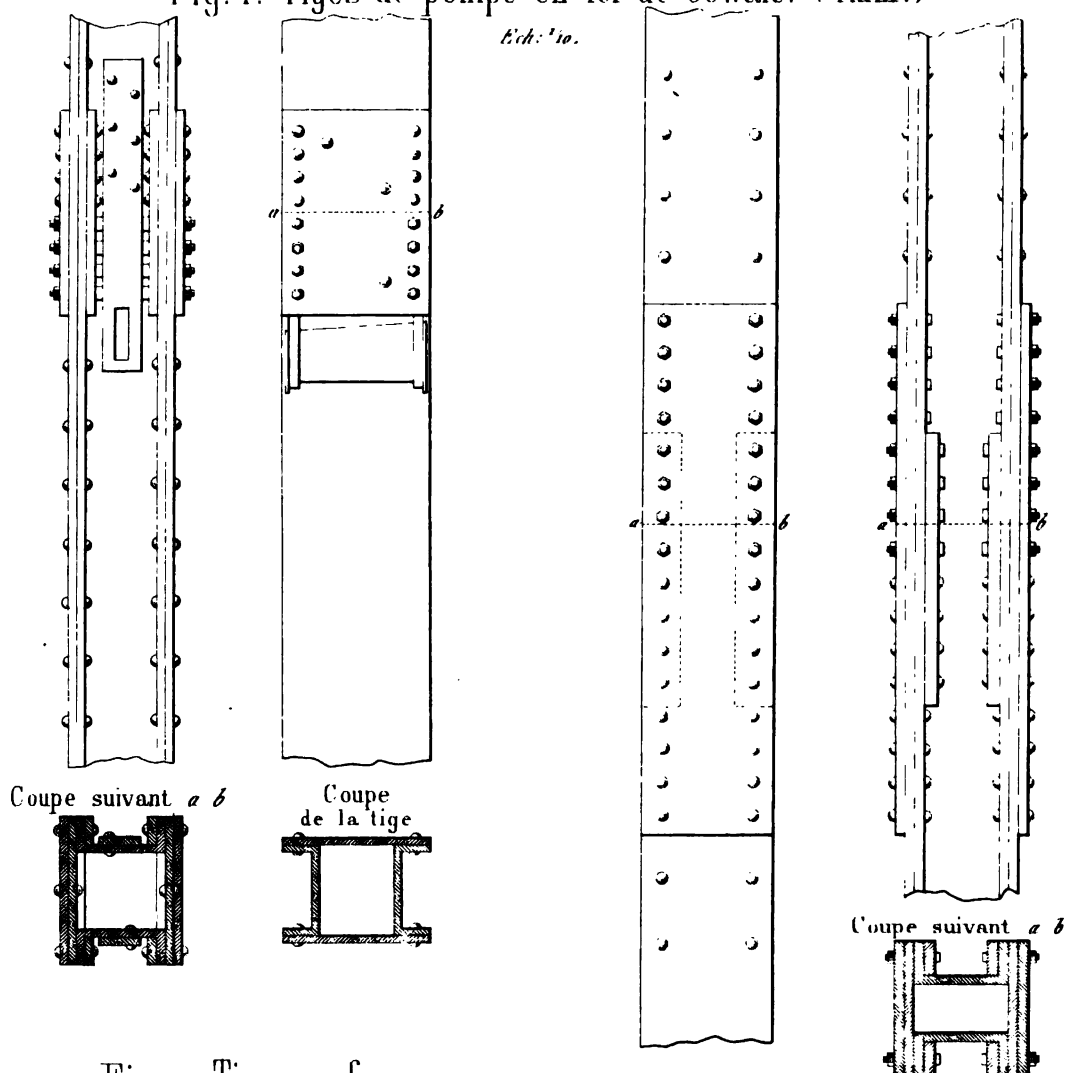
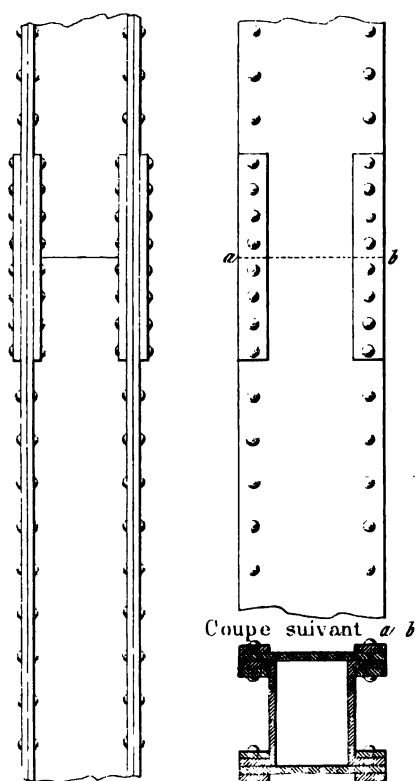
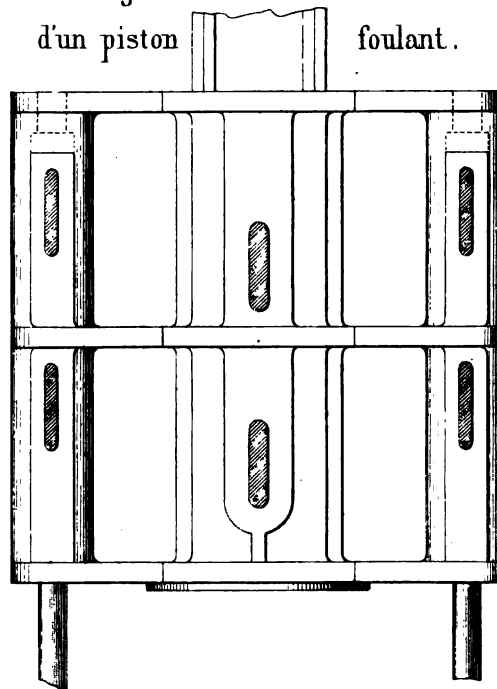
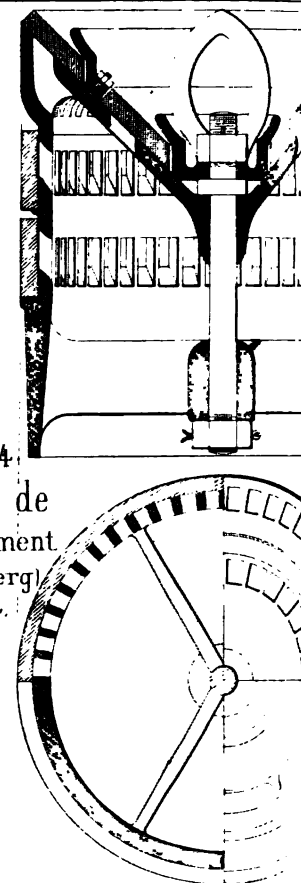


Fig. 2. Tige en fer.

Fig. 3. Pièce d'attache
d'un piston foulant.Fig. 4.
Clapet de
refoulement
(Altenberg)

Ech. 1/20.

Fig. 5.
Clapet
d'aspiration
(Altenberg)

Ech. 1/20.

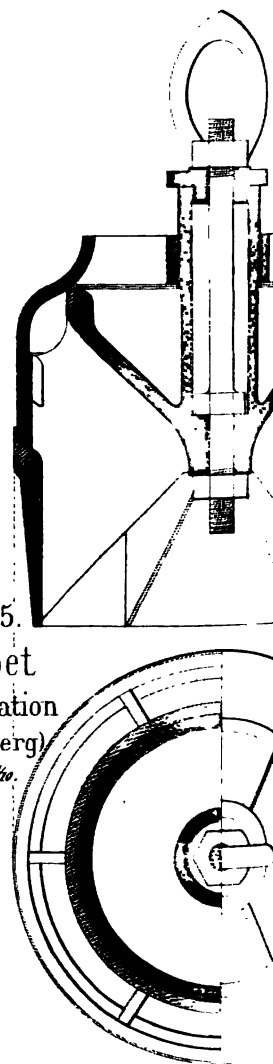


Fig. 6.
Clapet de
refoulement
(Creusot)
Ech. 2/30.

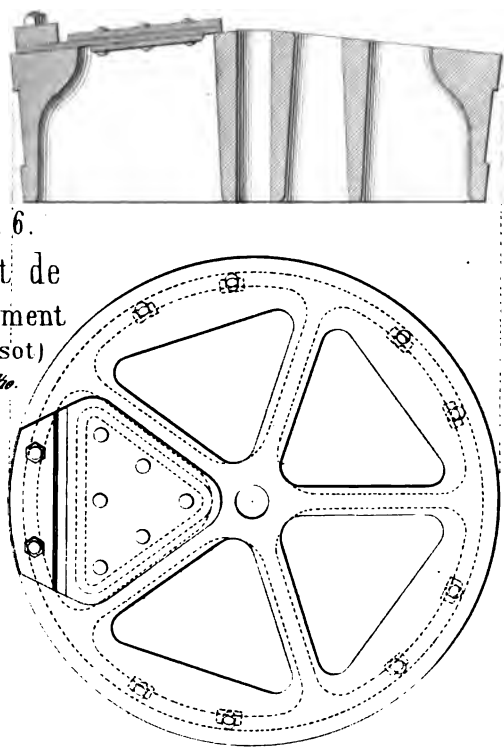


Fig. 7.
Clapet
d'aspiration
(Creusot)
Ech. 2/30.

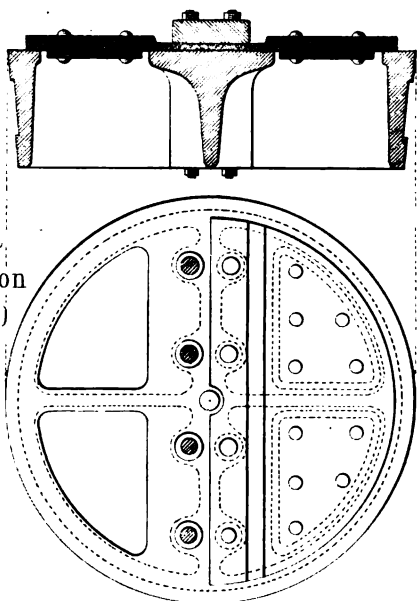


Fig. 8.
Clapet du
Grand Hornu.
Ech. 2/30.

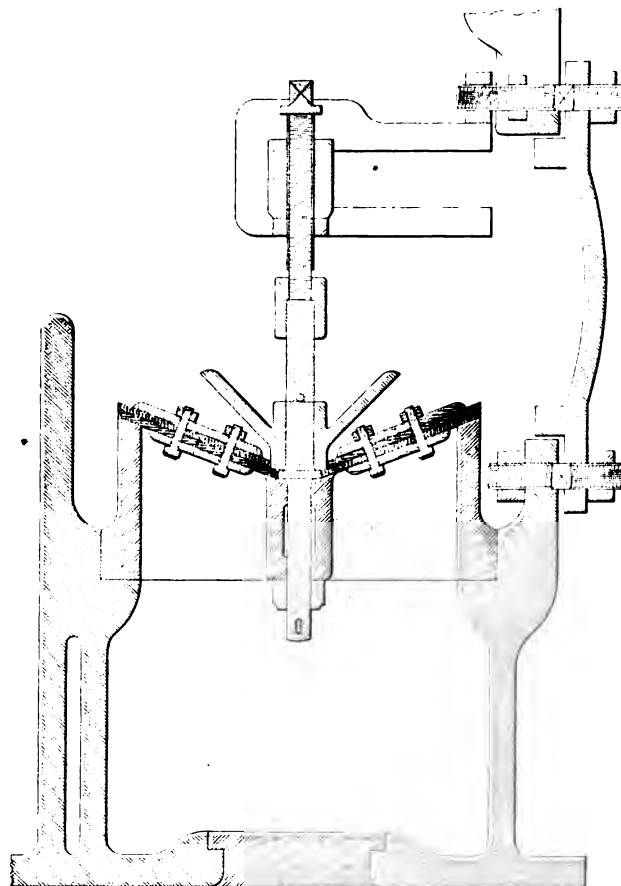


Fig. 9.
Piston Le Testu.
Ech. 1/5.

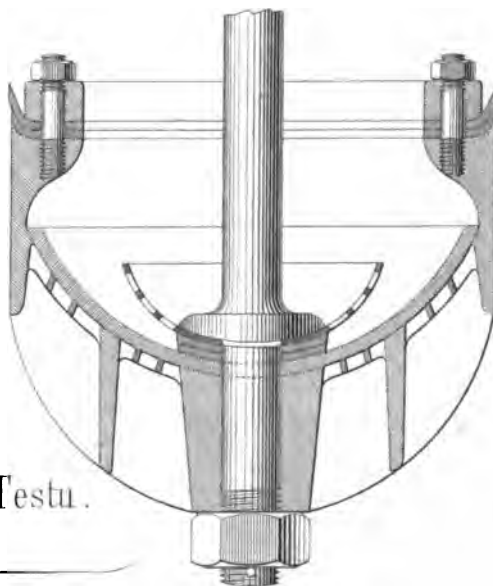
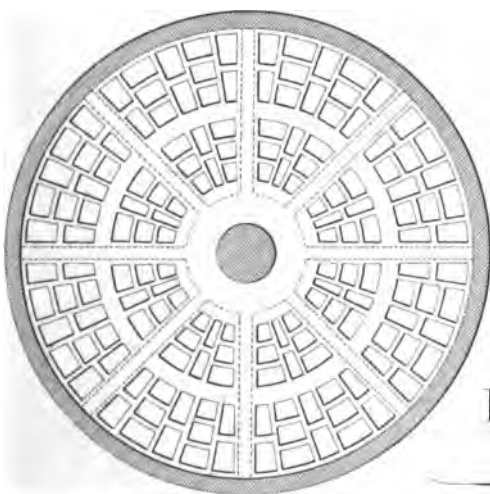


Fig. 5. INSTALLAT

Fig. 1.
POMPE
ÉLEVATOIRE
de Fiennes.

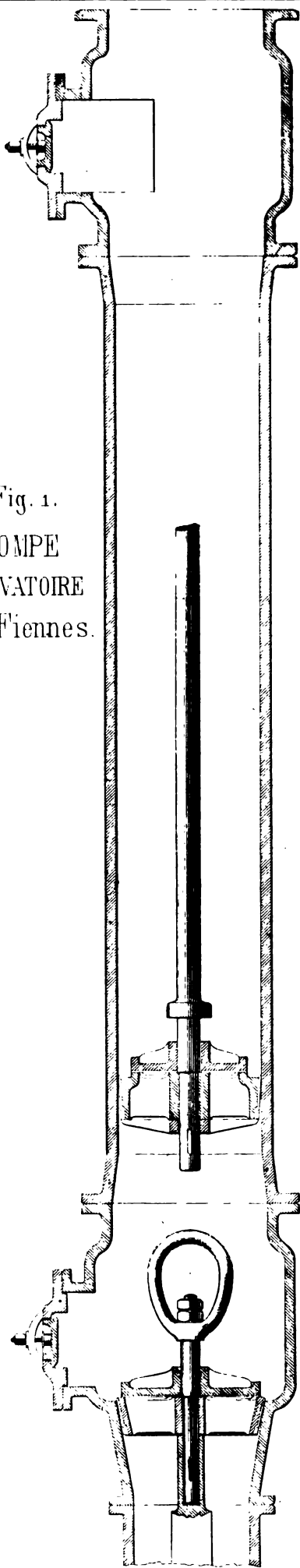
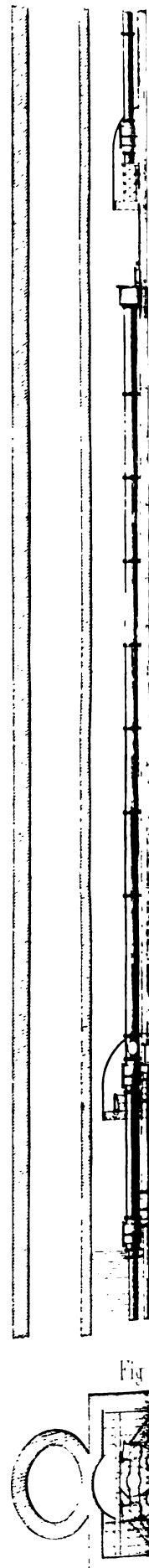
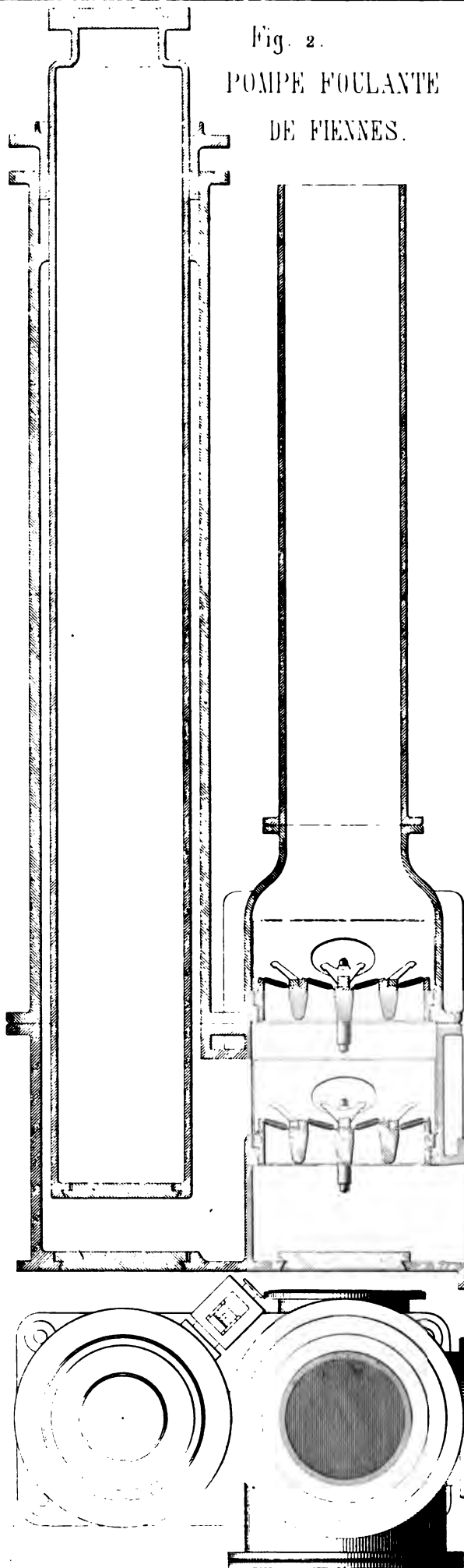


Fig. 2.
POMPE FOULANTE
DE FIENNES.



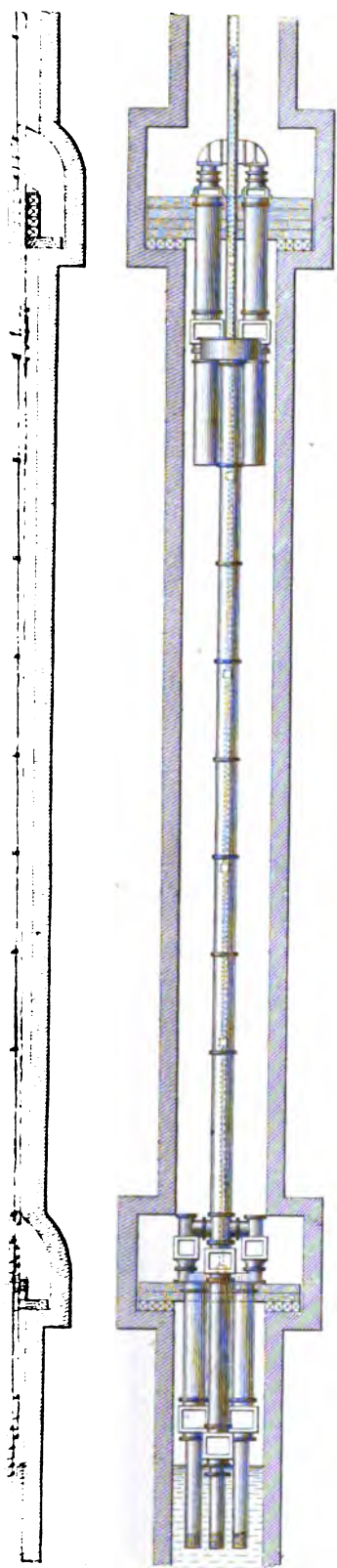
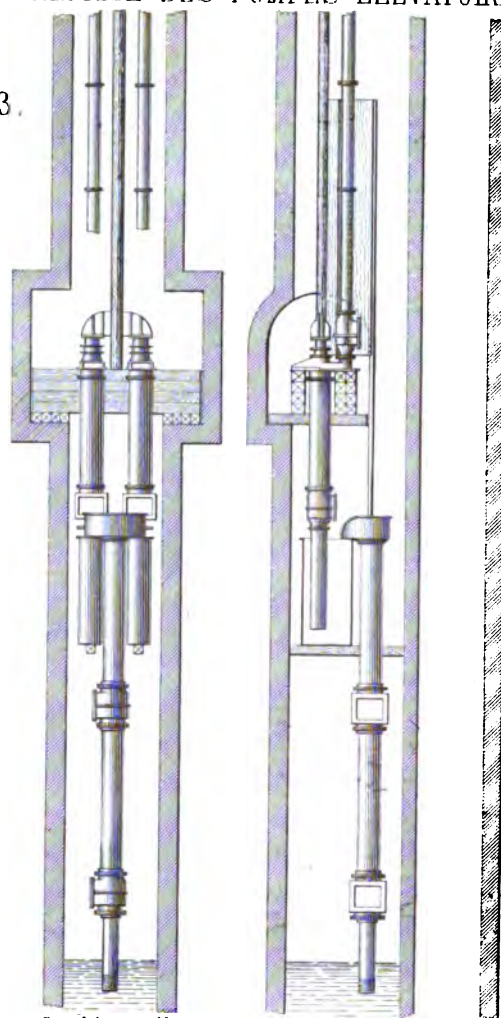


Fig. 3.



Plan de l'installation
des pompes foulantes.

Fig. 6.

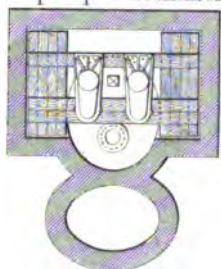
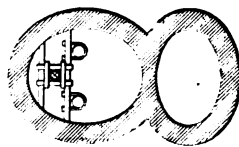


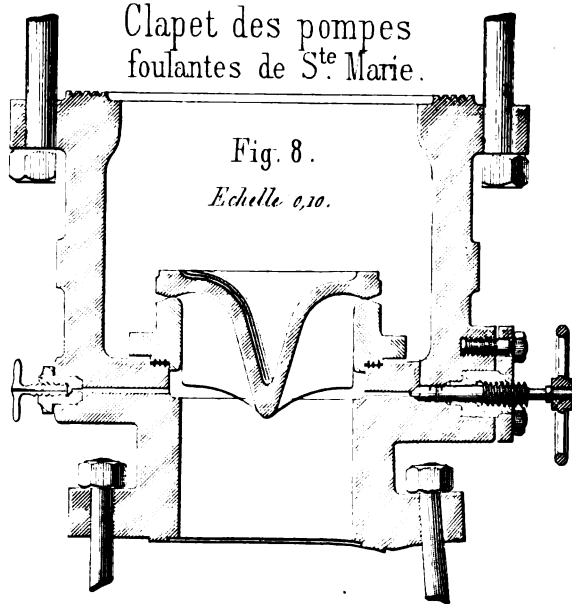
Fig. 7.

Coupe du puits.



Clapet des pompes
foulantes de S^{te} Marie.

Fig. 8.
Echelle 0,10.



Plan de
l'installation
des pompes.

Echelle 0,005

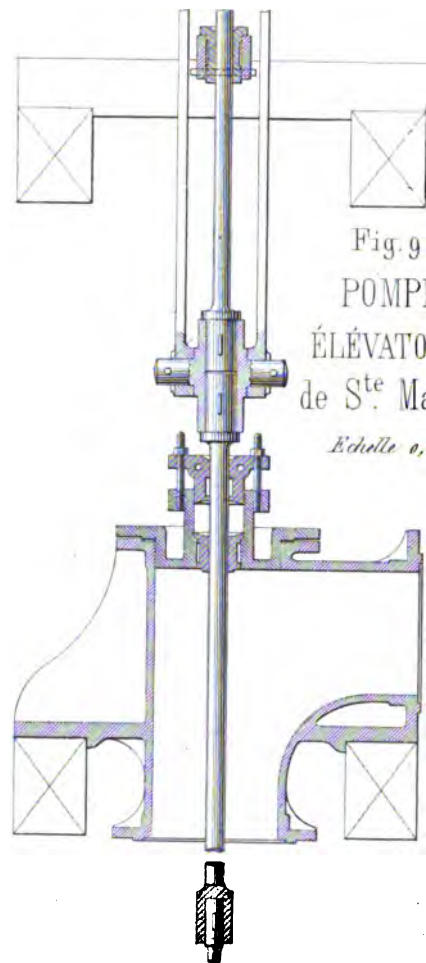


Fig. 9.
POMPE
ÉLEVATOIRE.
de S^{te} Marie.
Echelle 0,05.

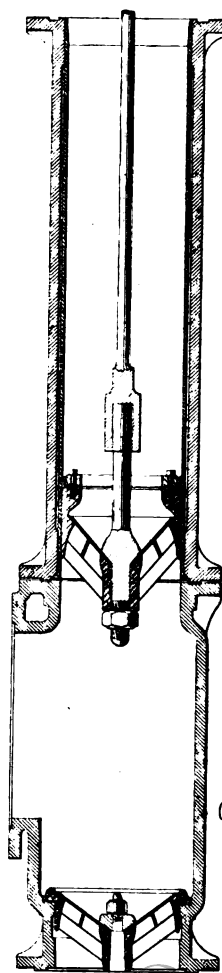
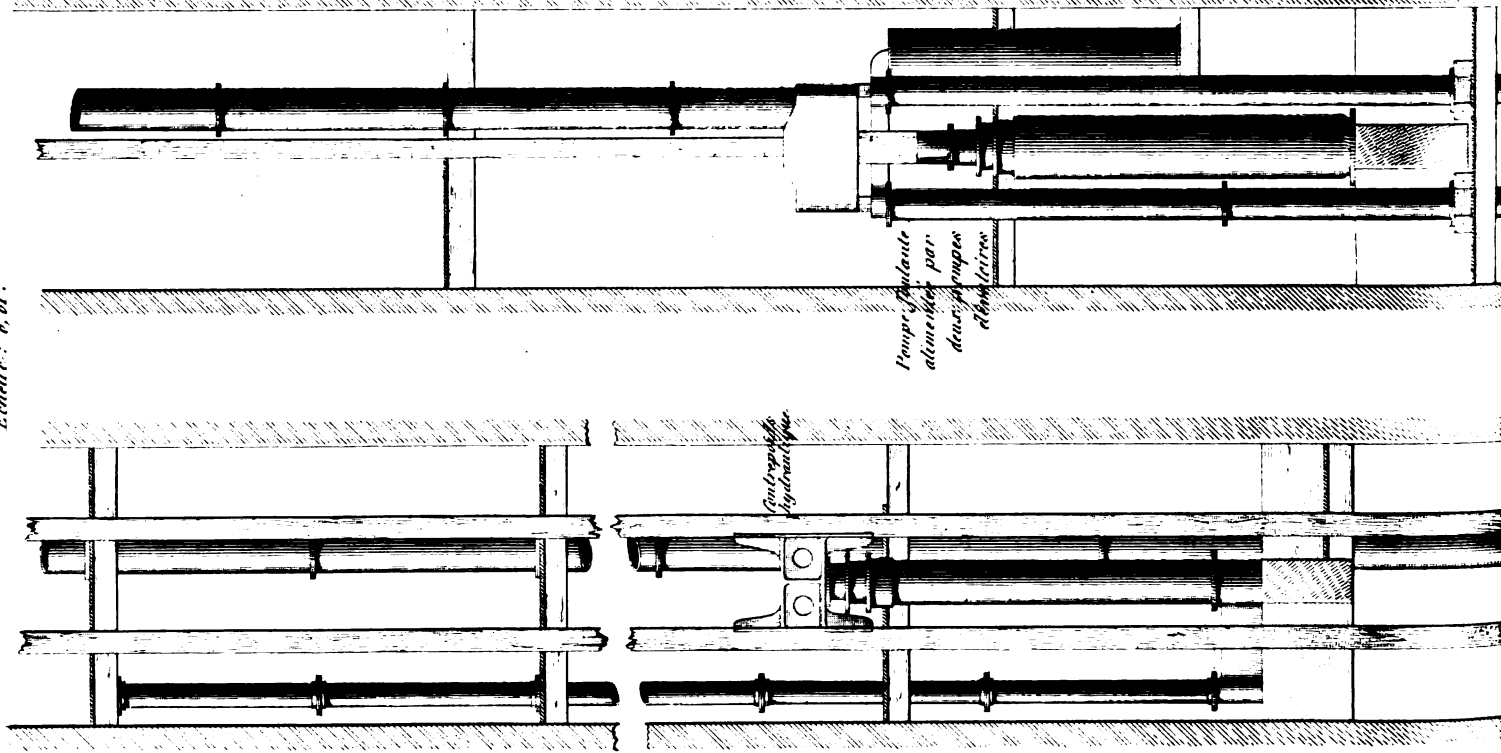
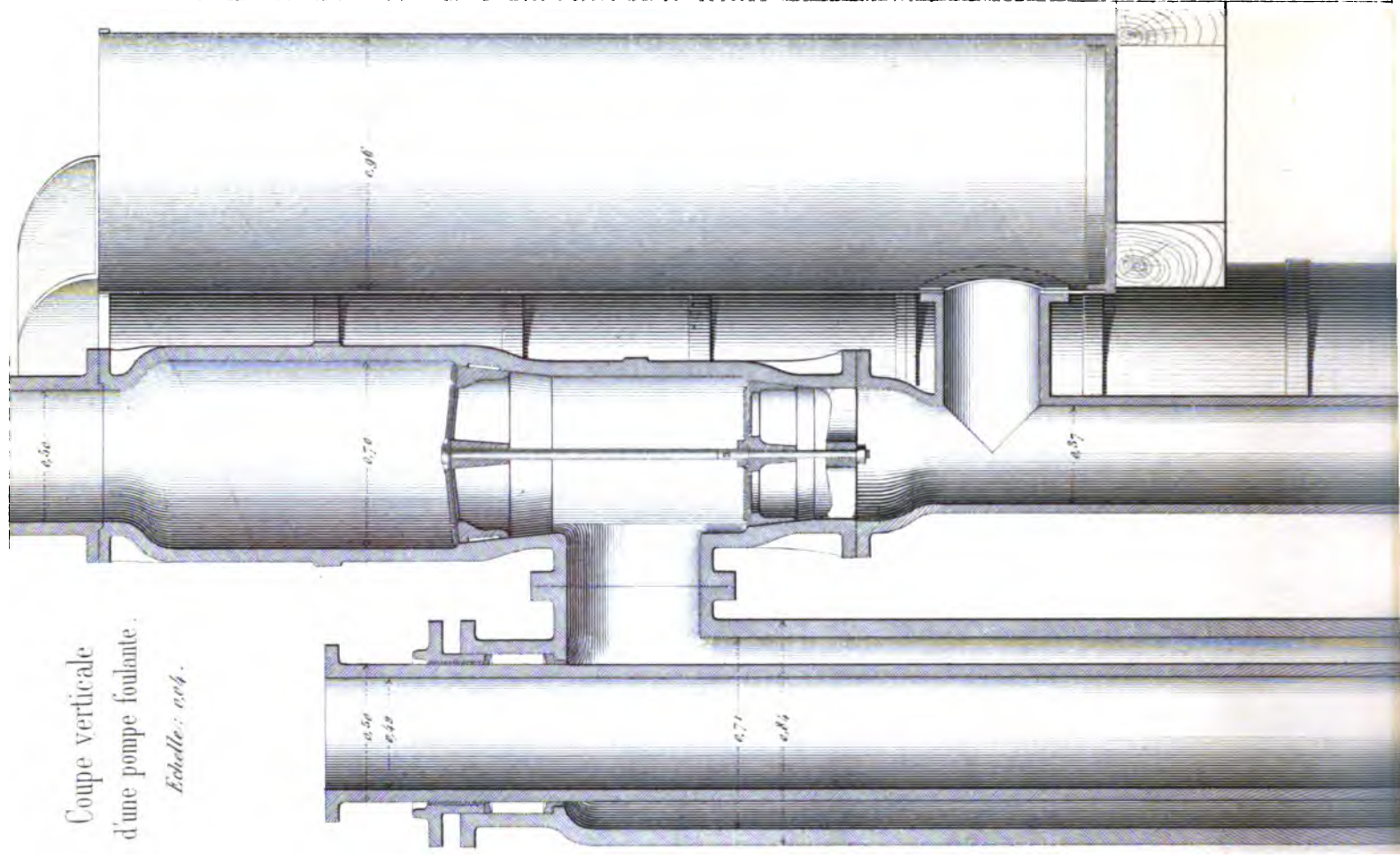


Fig. 10.
POMPE
ÉLEVATOIRE
de S^{te} Marie.

INSTALLATION DES POMPES.

Echelle: 0,01.Coupe verticale
d'une pompe foulante.*Echelle: 0,04.*

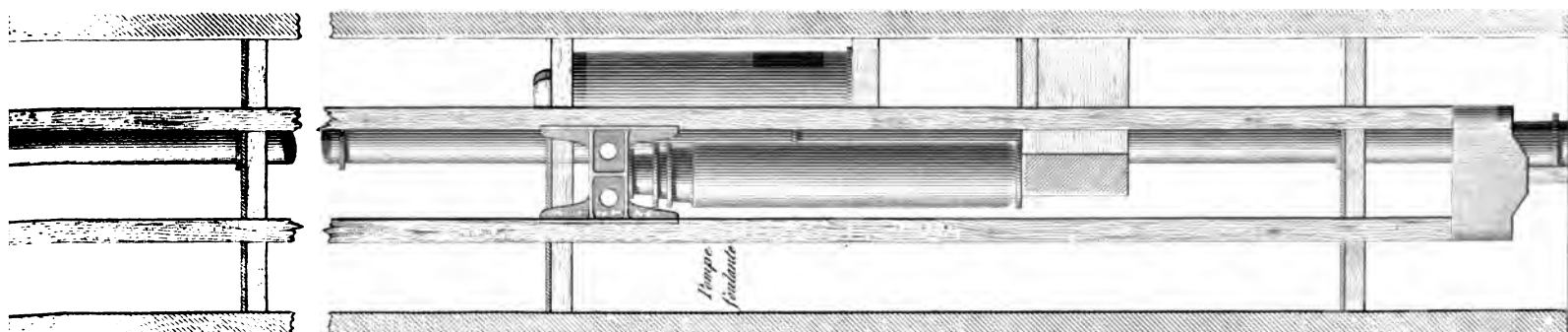
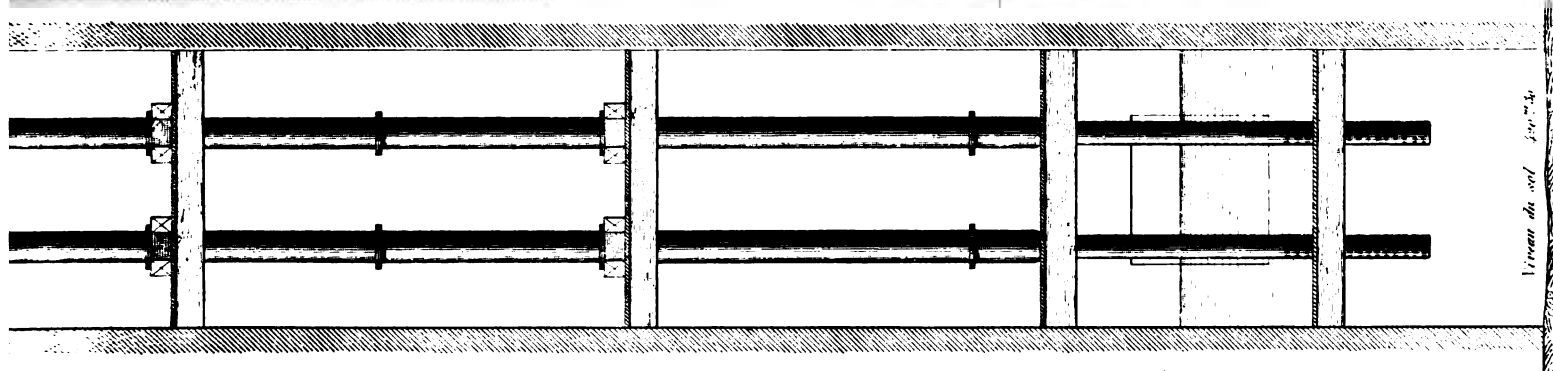
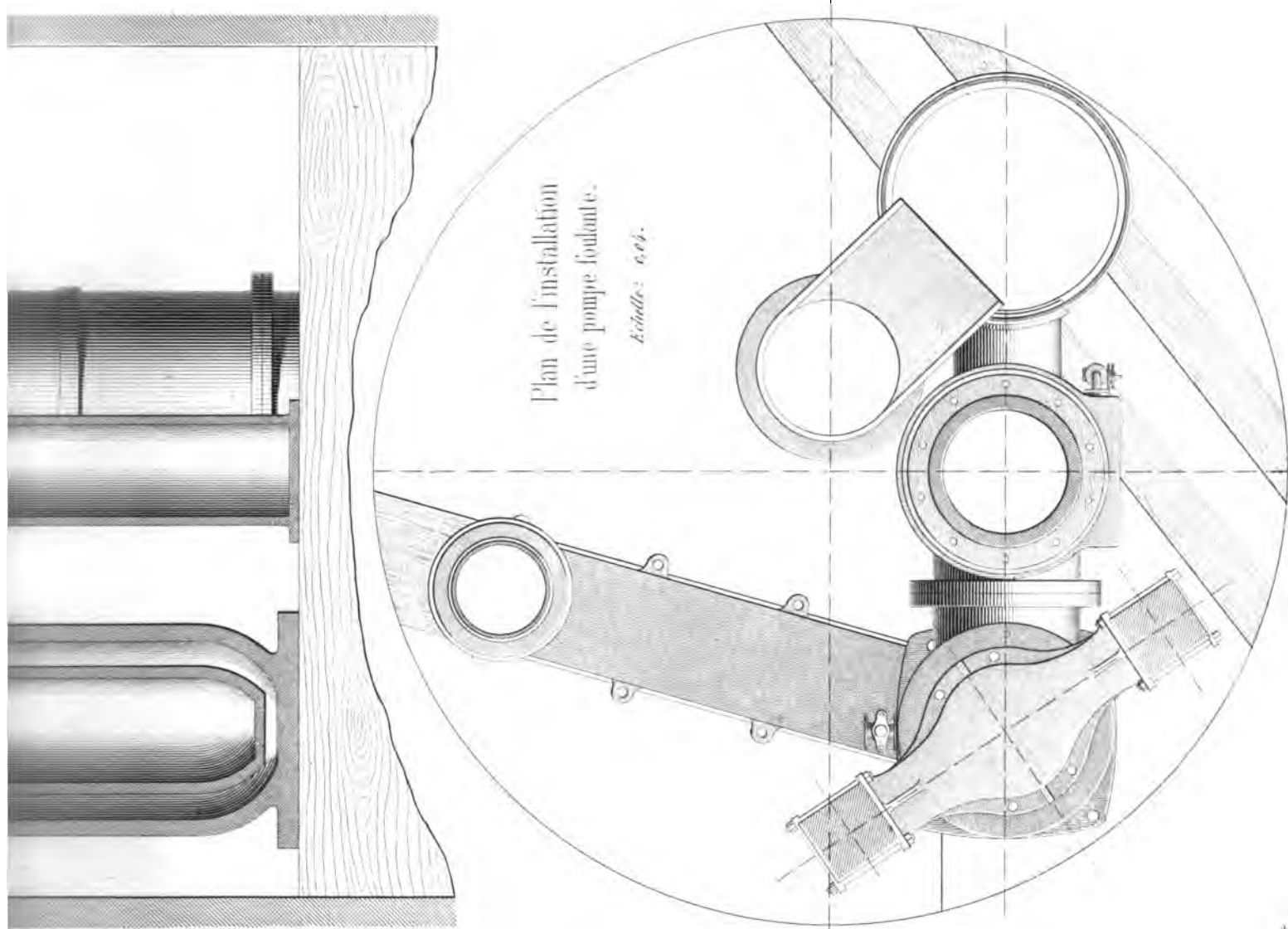


Fig. 2. Plan.

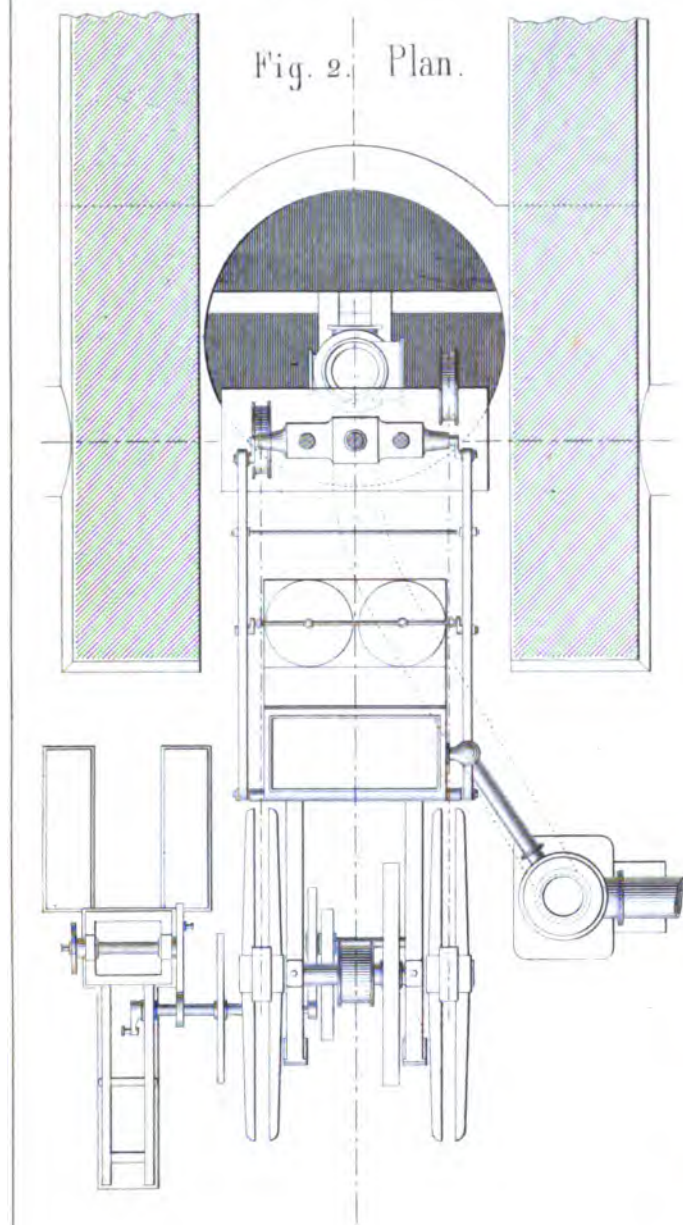
Elevation.
Disposition des
contrebalanciers.

Fig. 3.

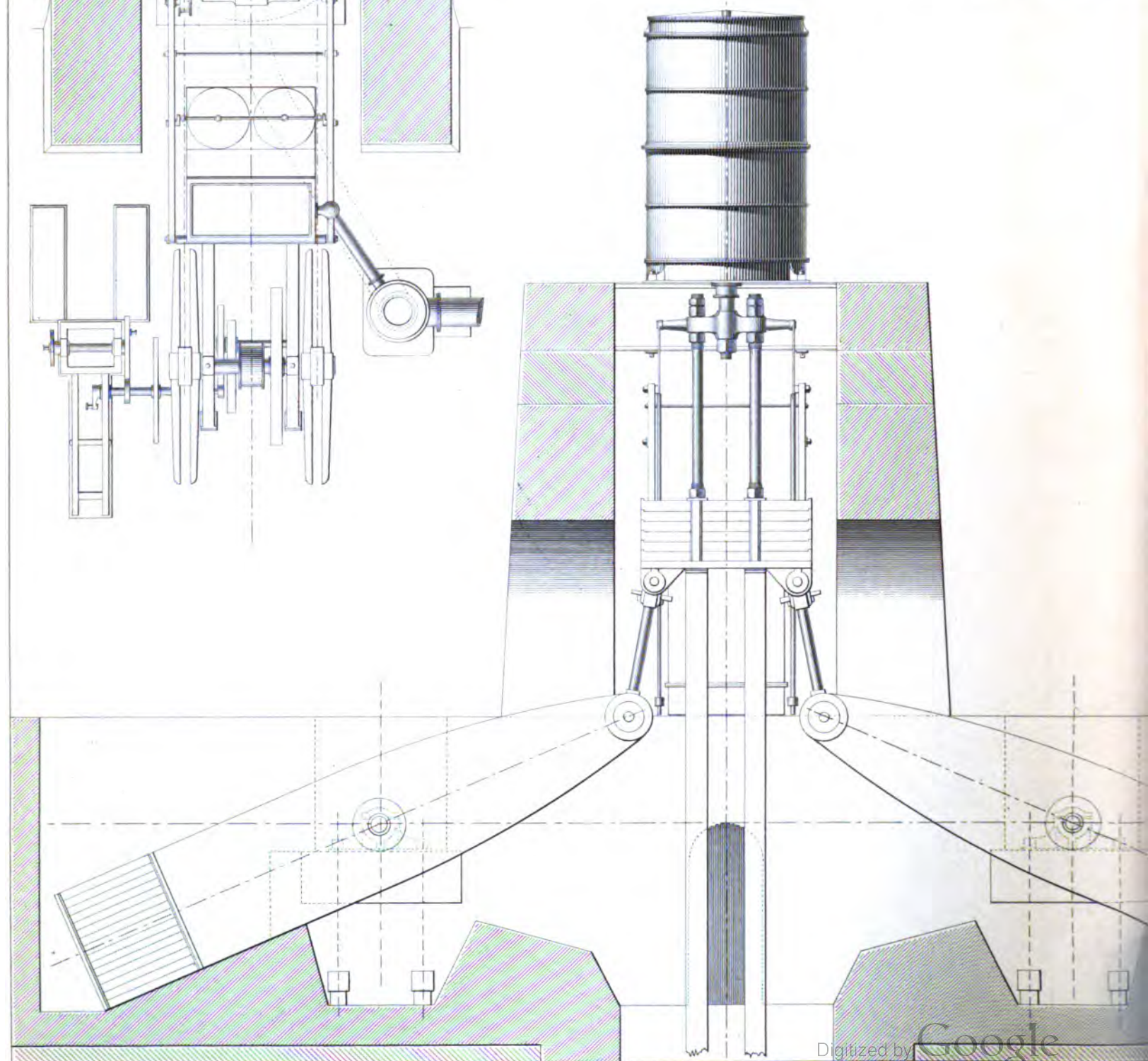


Fig. 4.

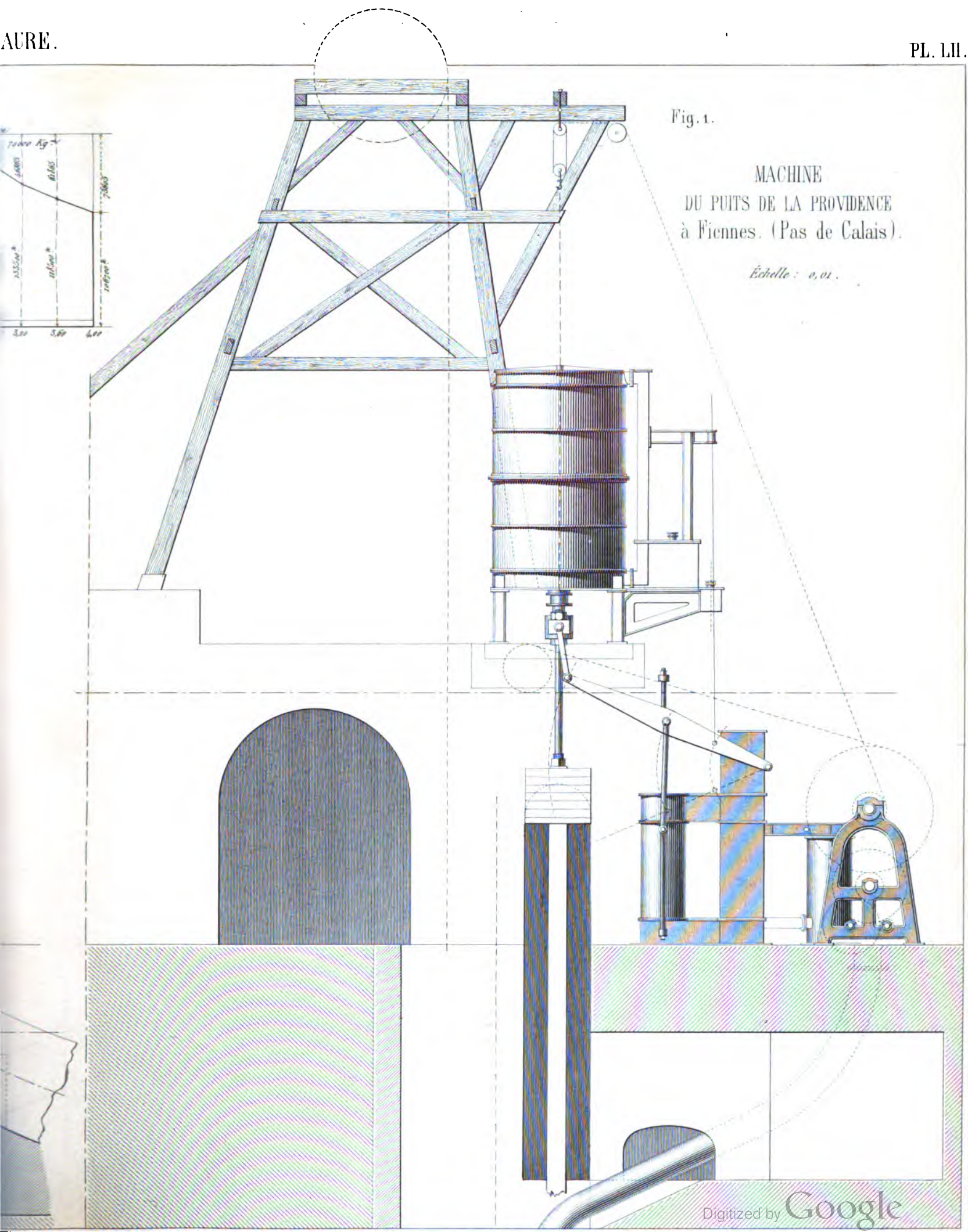




Fig. 1.

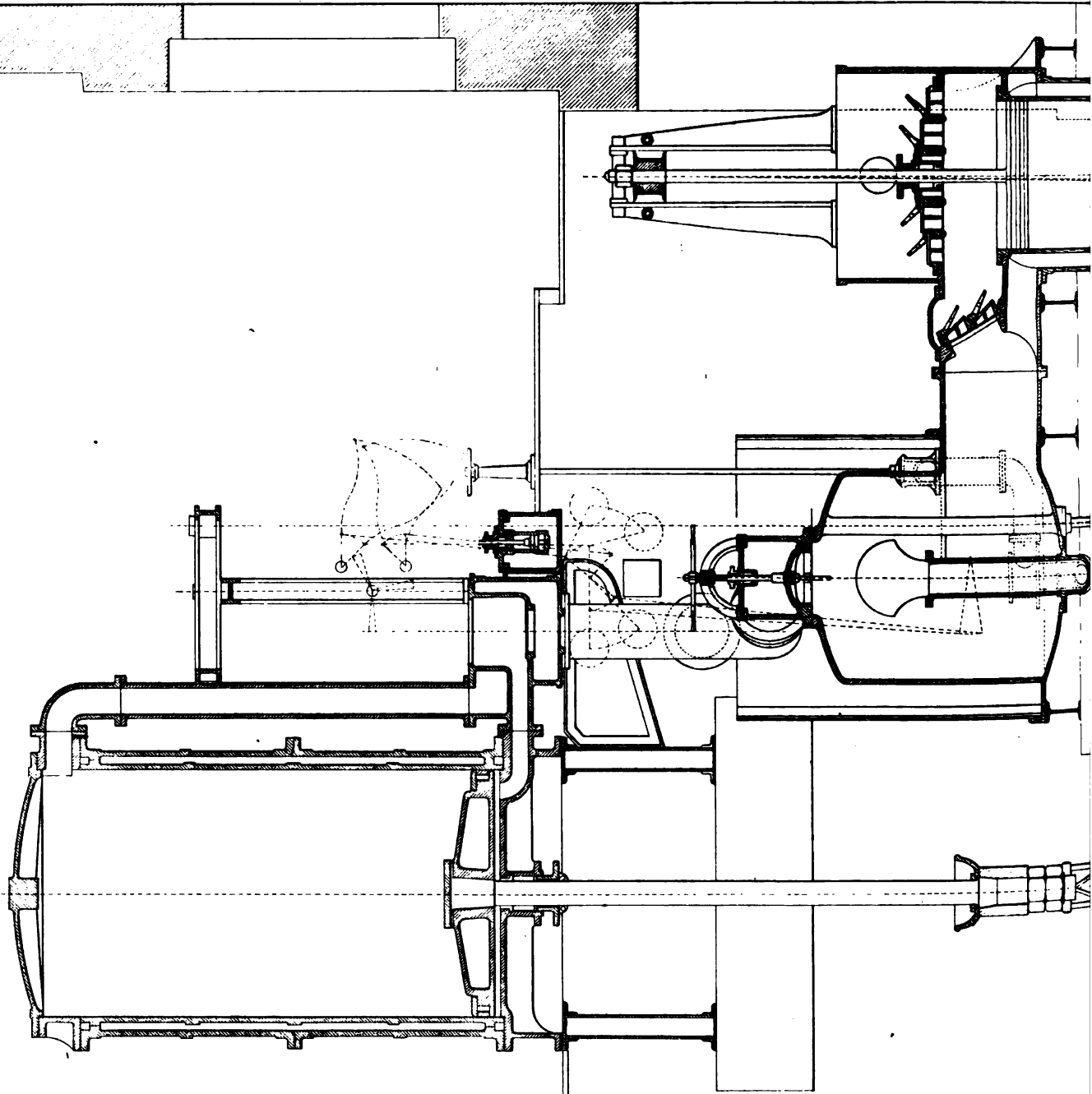
MACHINE
DU Puits de la Providence
à Fiennes. (Pas de Calais).

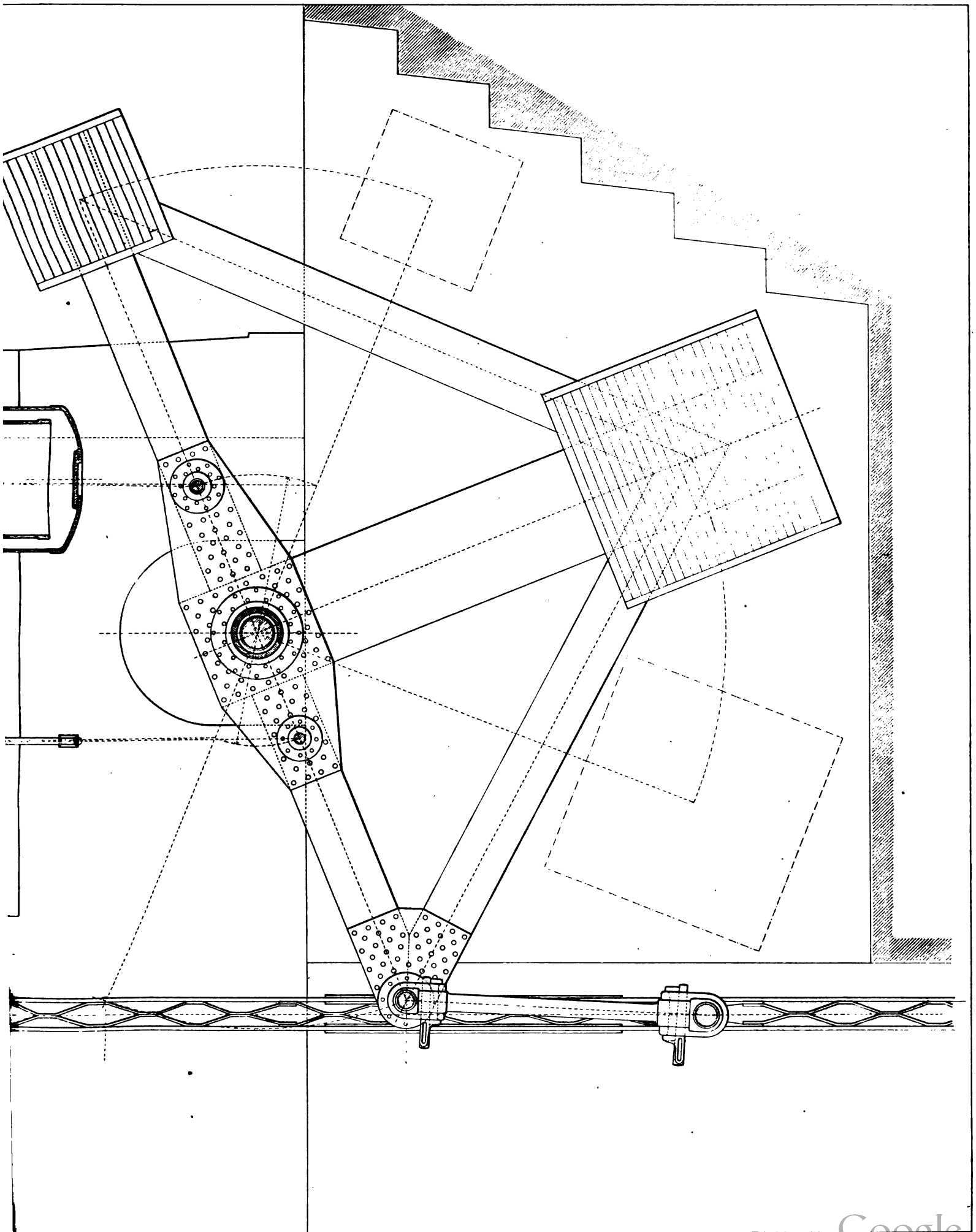
Échelle : 0,01.



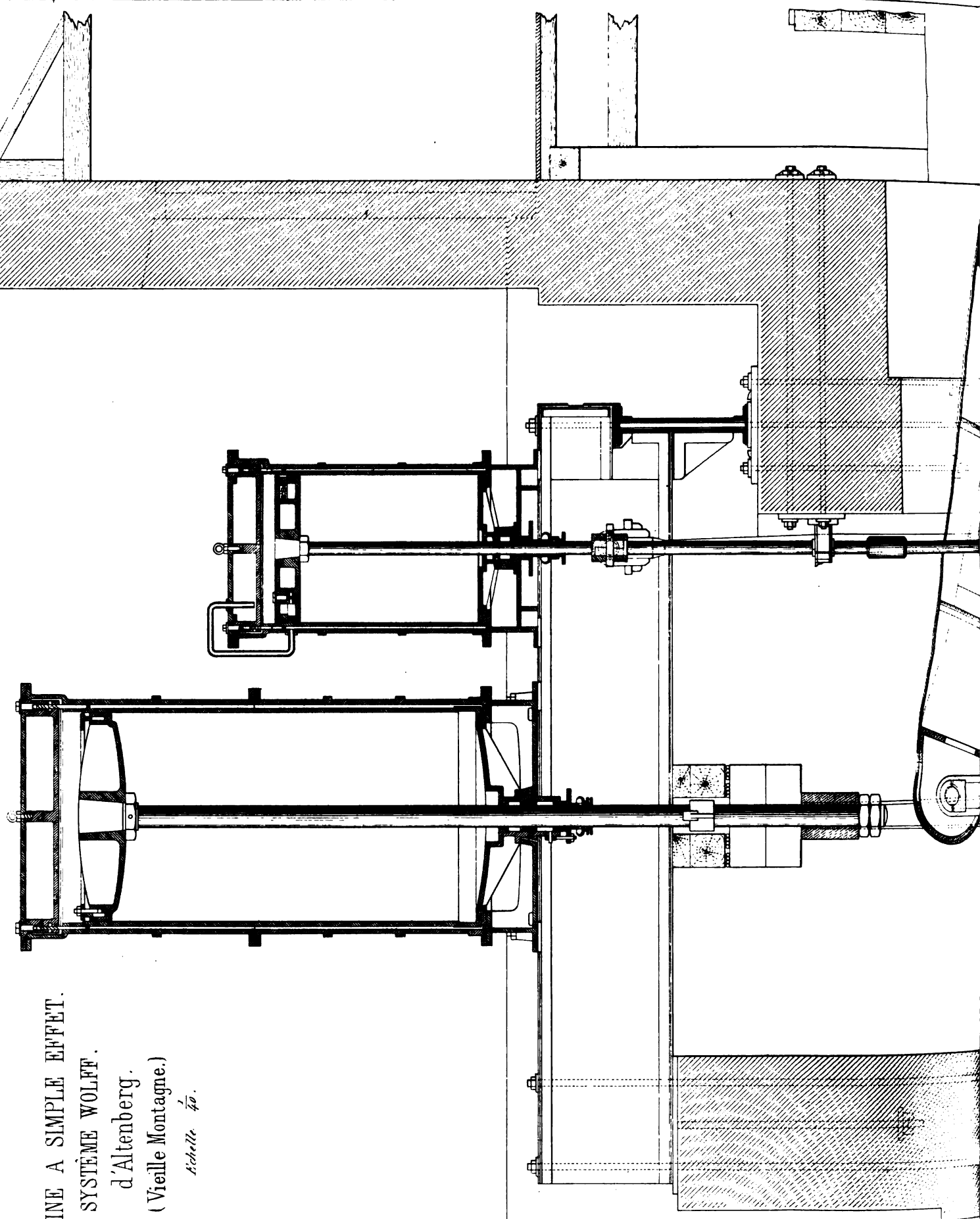
MACHINE DE Kladno, par Quillacq
SYSTÈME BOCKHOTZ.

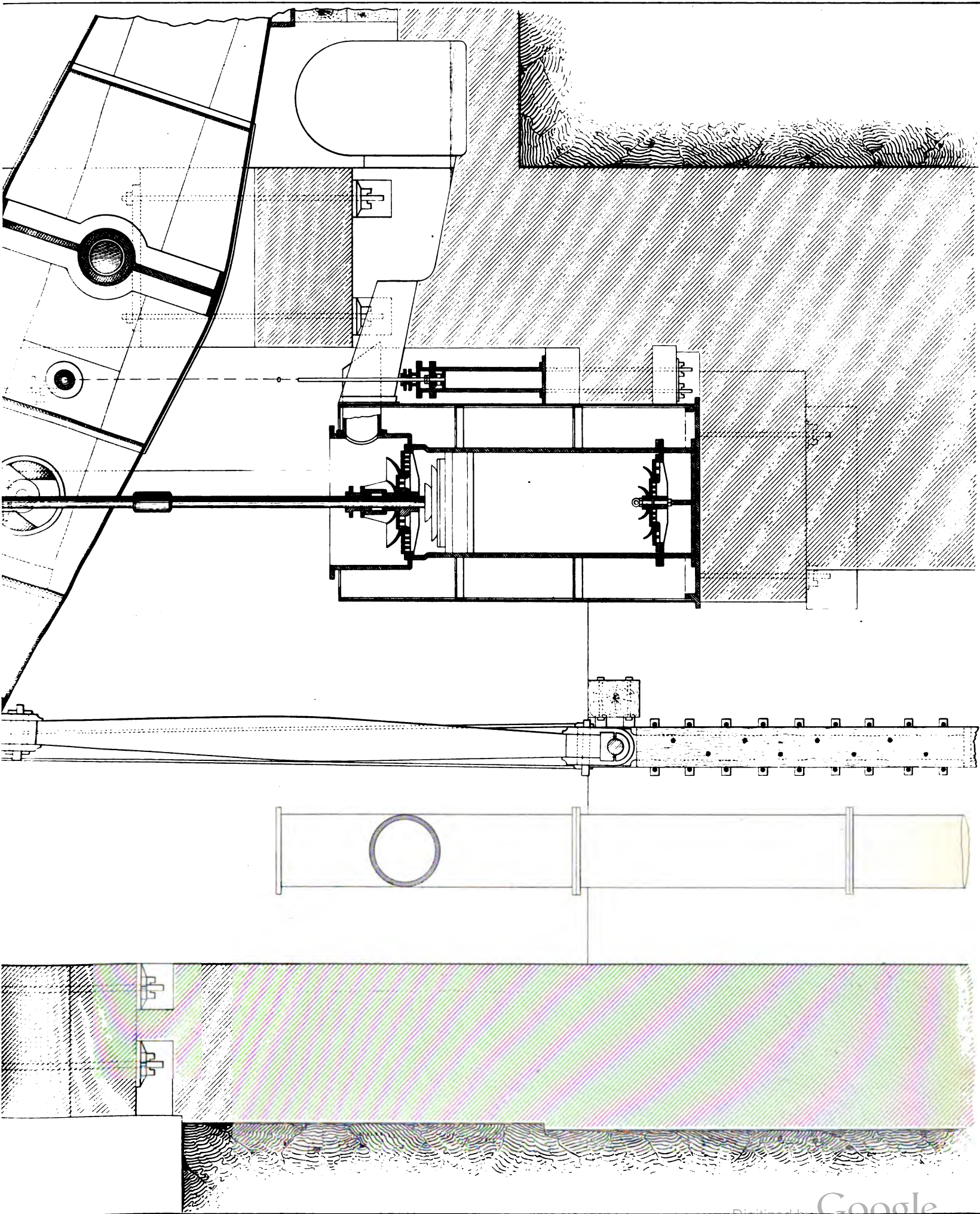
Echelle 0,12.





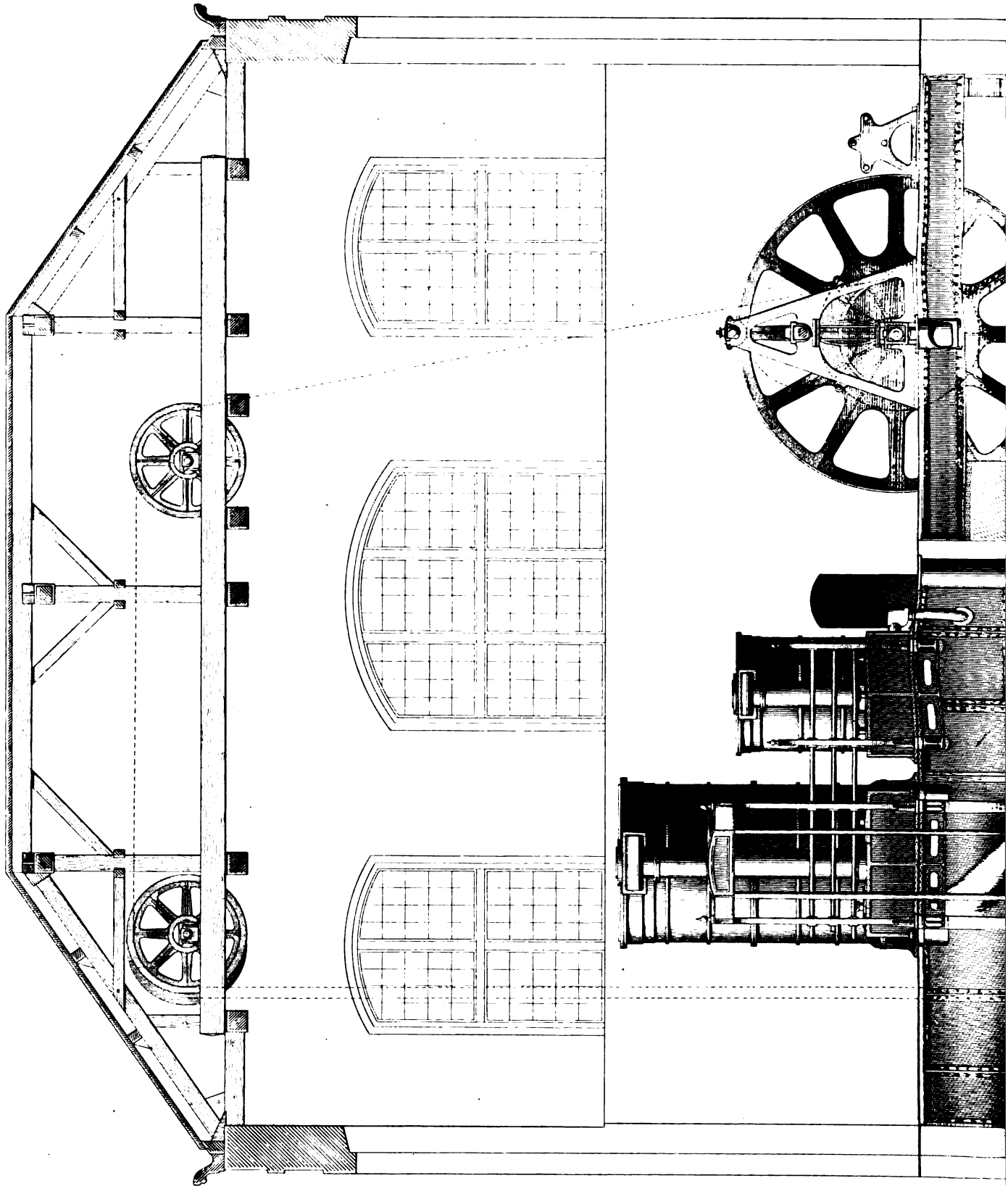
MACHINE A SIMPLE EFFET.
 SYSTÈME WOLFF.
 d'Altenberg.
 (Vieille Montagne.)
Échelle $\frac{1}{40}$.

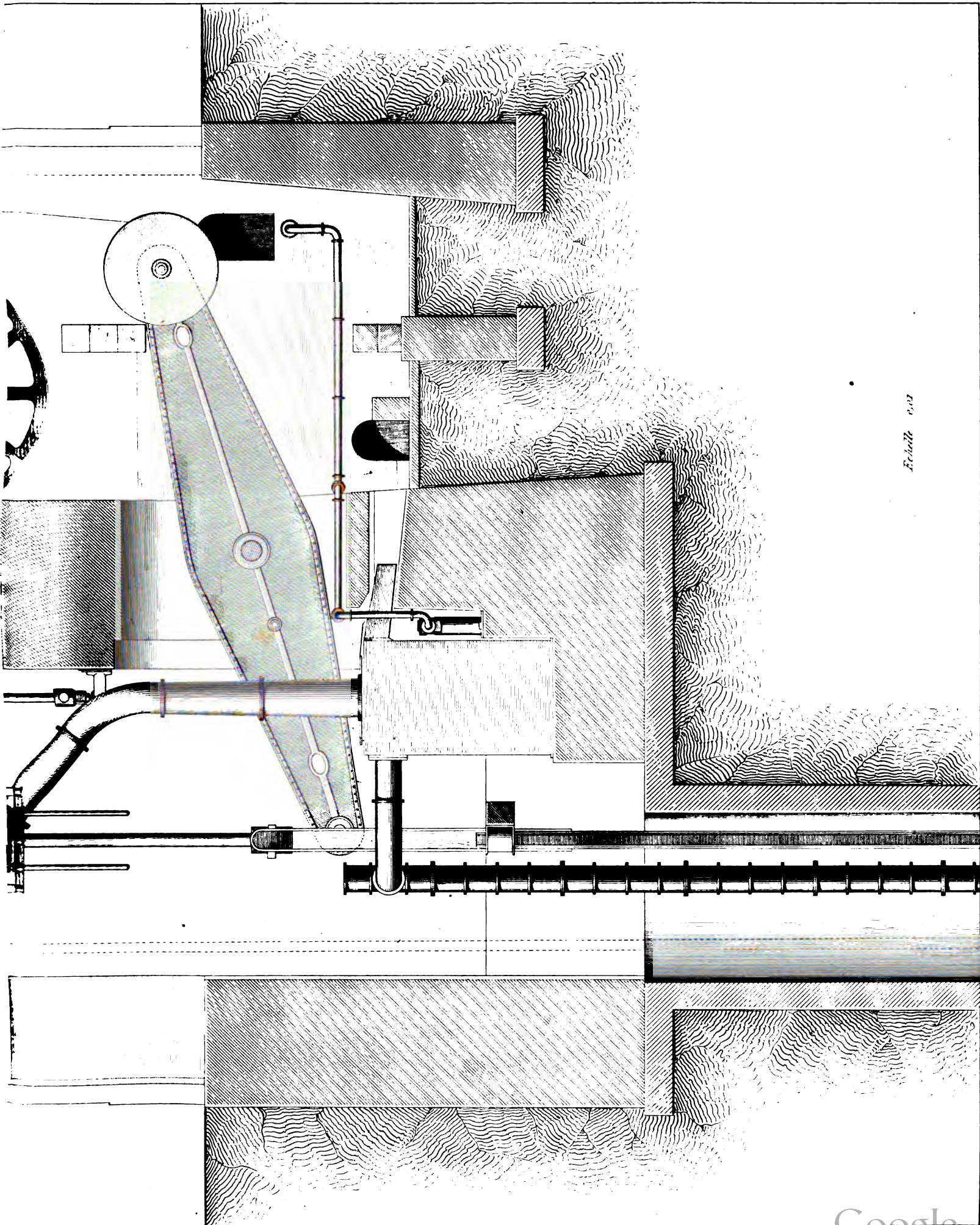




Étude de comp. de J. Baudry, à Liège

MACHINE DE 300 CHEVAUX.
DU PUIT S' LAURENT AU CREUSOT.

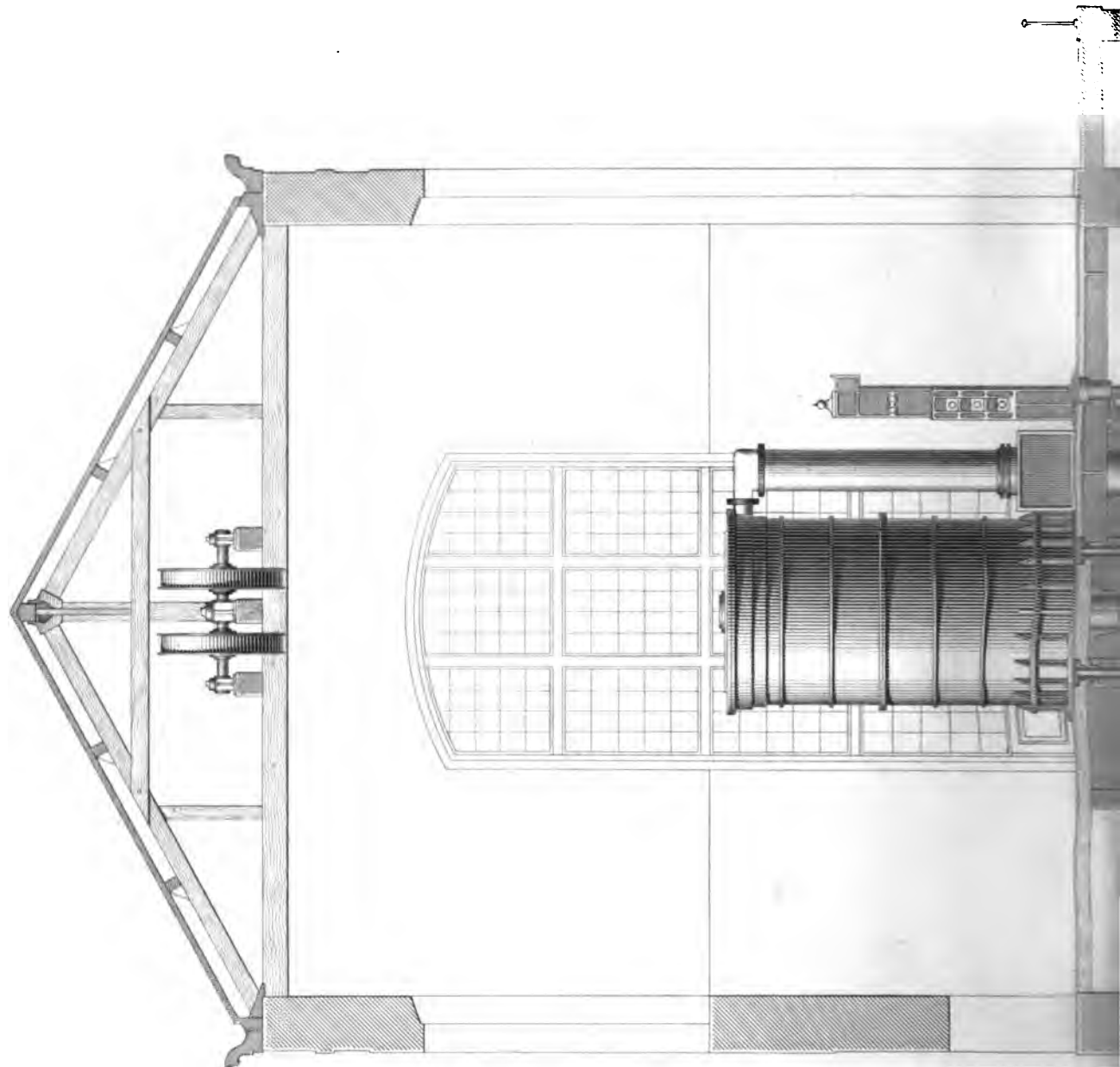


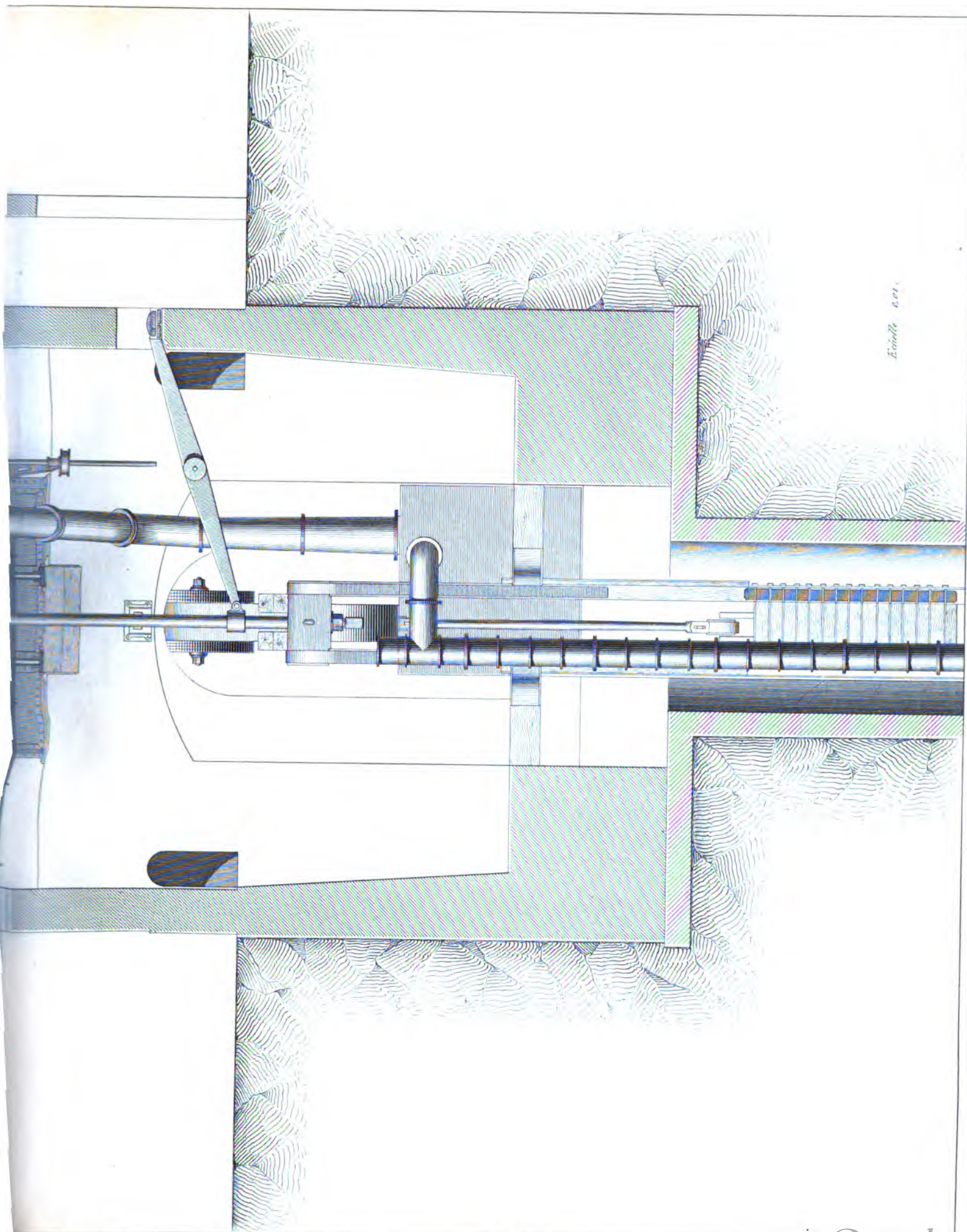


Echelle 0.01

Échelle de 0.01 m. à 1 m. de haut. à 1 m. de long.

MACHINE DE 300 CHEVAUX
DU PUTS ST LAURENT AU CREUSOT.

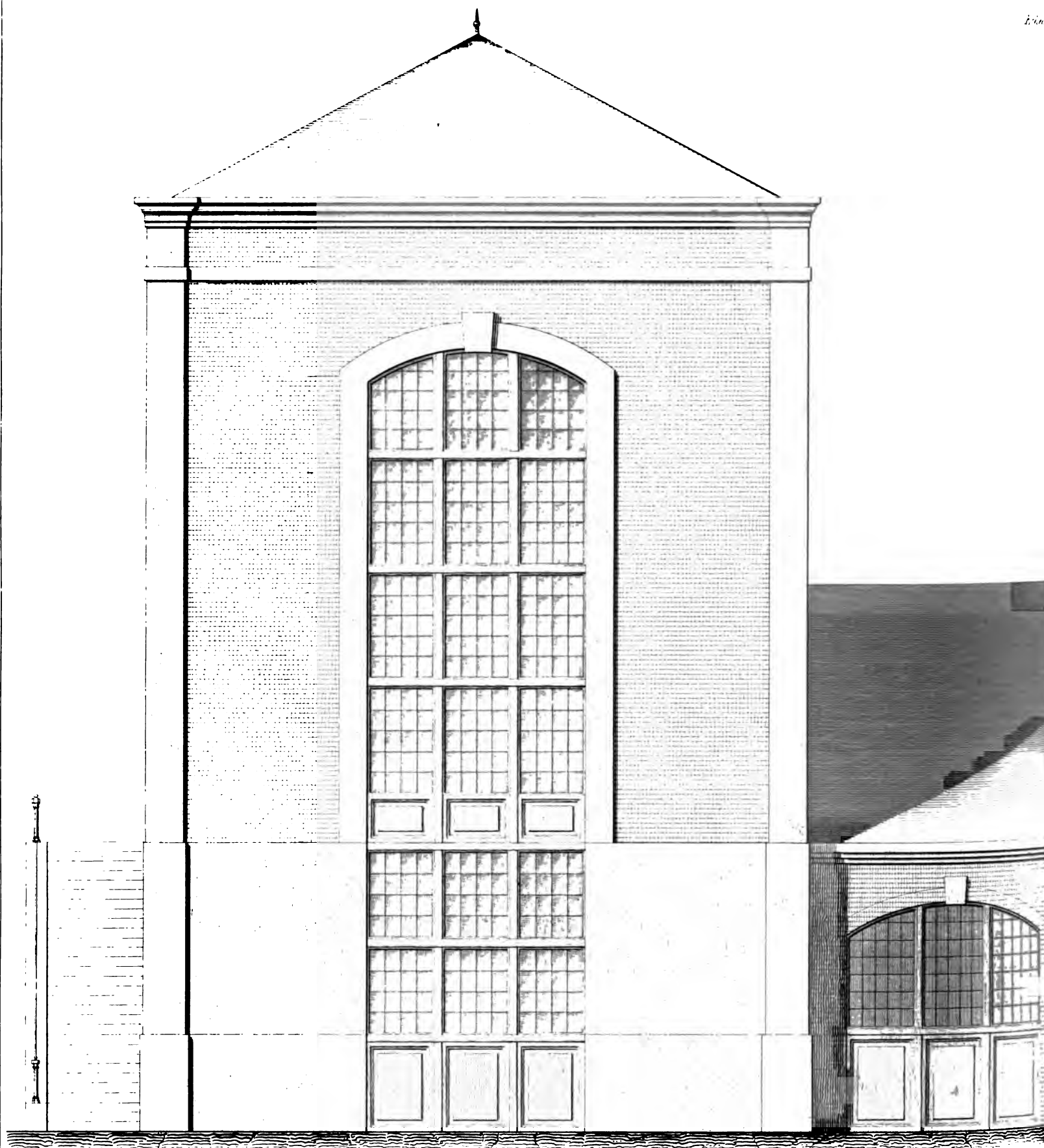




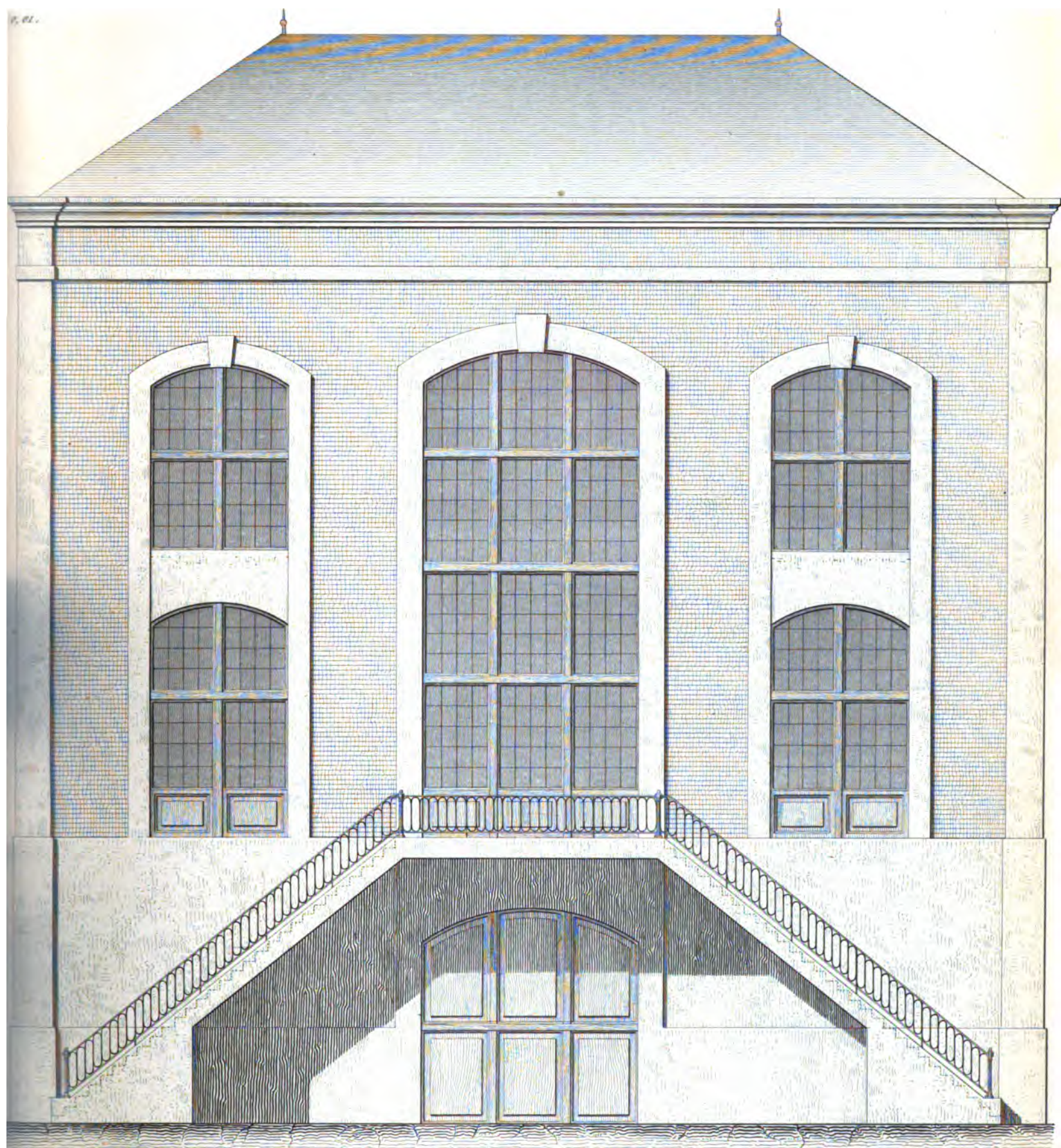
Eclairé d. v.

MACHINE DE 300 CHEVAUX DU

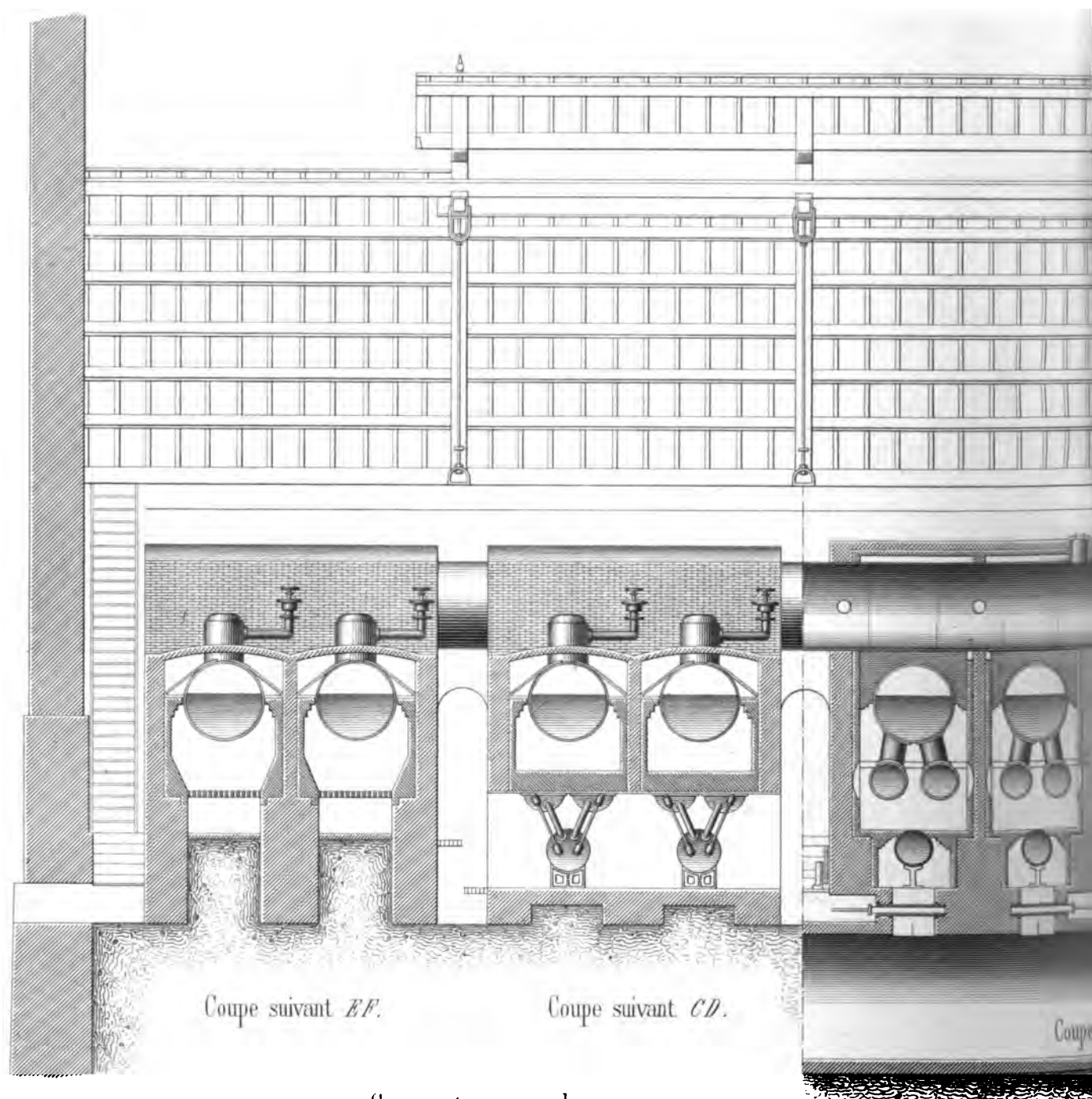
Échelle



T'S ST LAURENT AU CREUSOT.



MACHINE ST. LAURENT AU CREUX



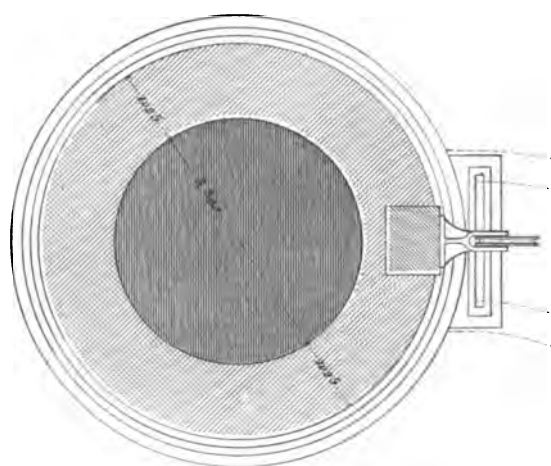
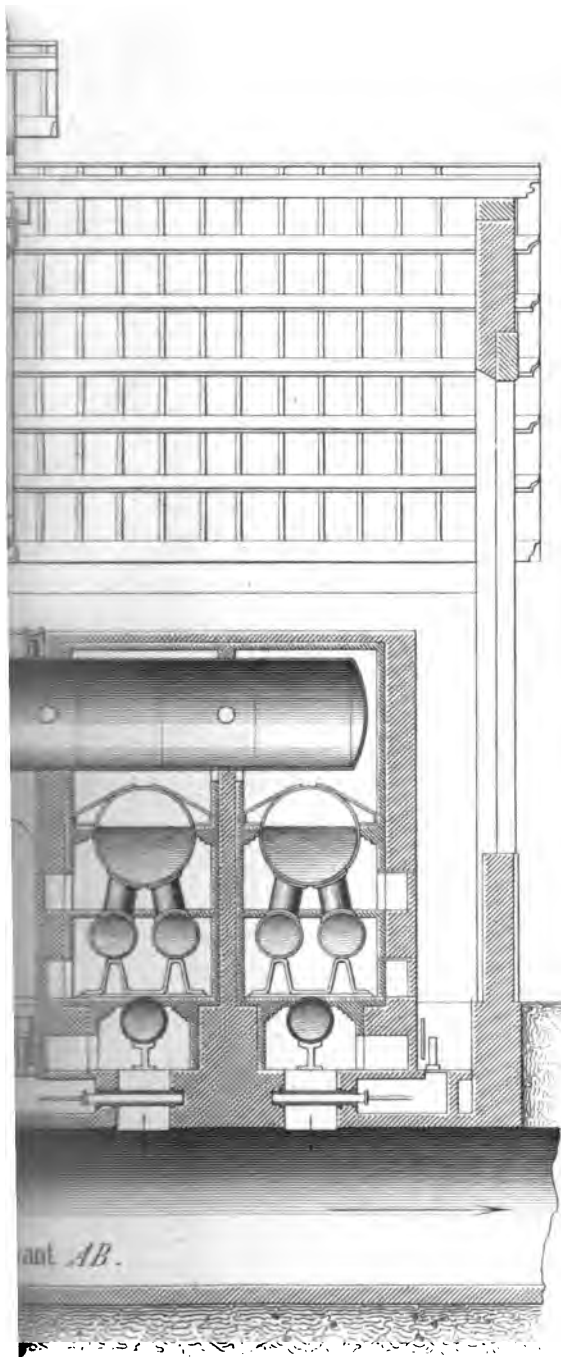
Coupe suivant *EF*.

Coupe suivant *CD*.

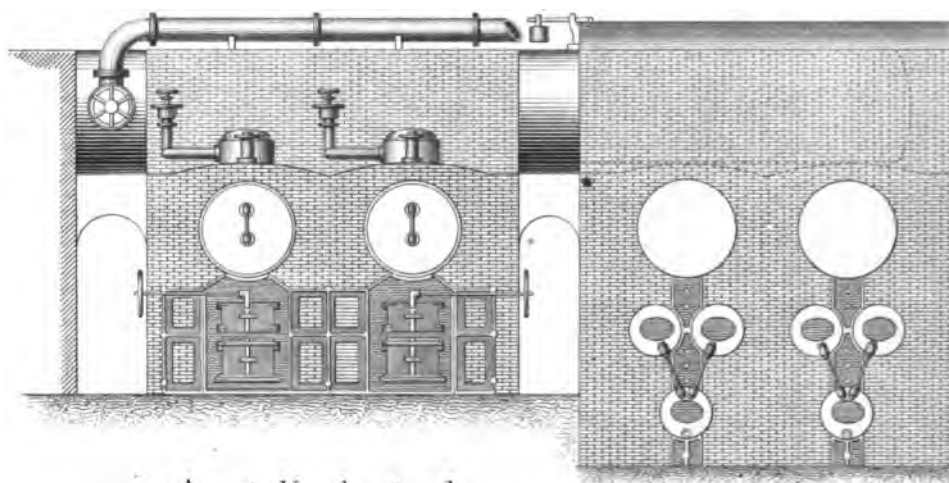
Coupes transversales.

Ech

INSTALLATION DES CHAUDIÈRES.

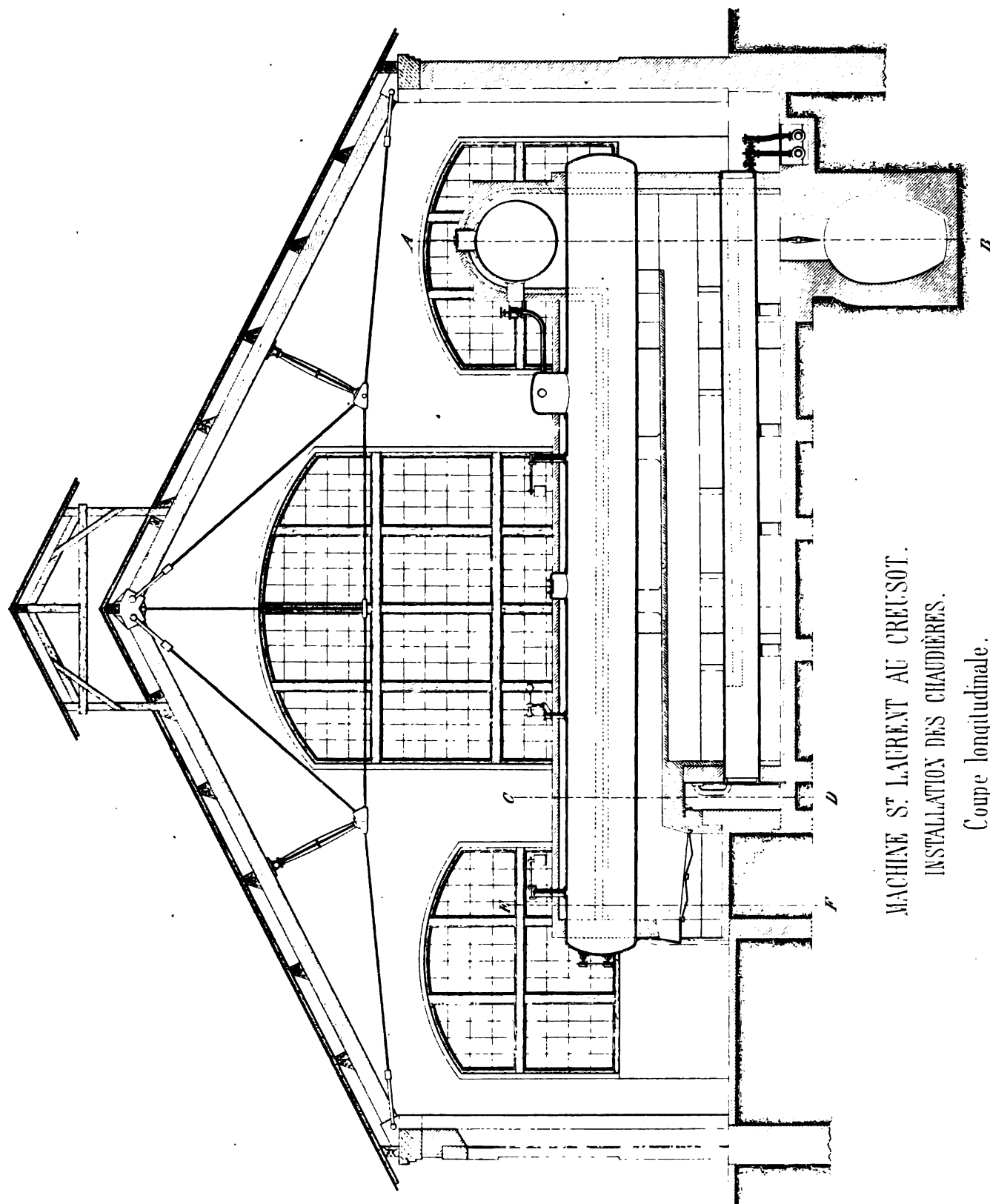


Section à la base de la cheminée.



Avant. Vue des tirsards.

Arrière. Vue des bouilleurs.



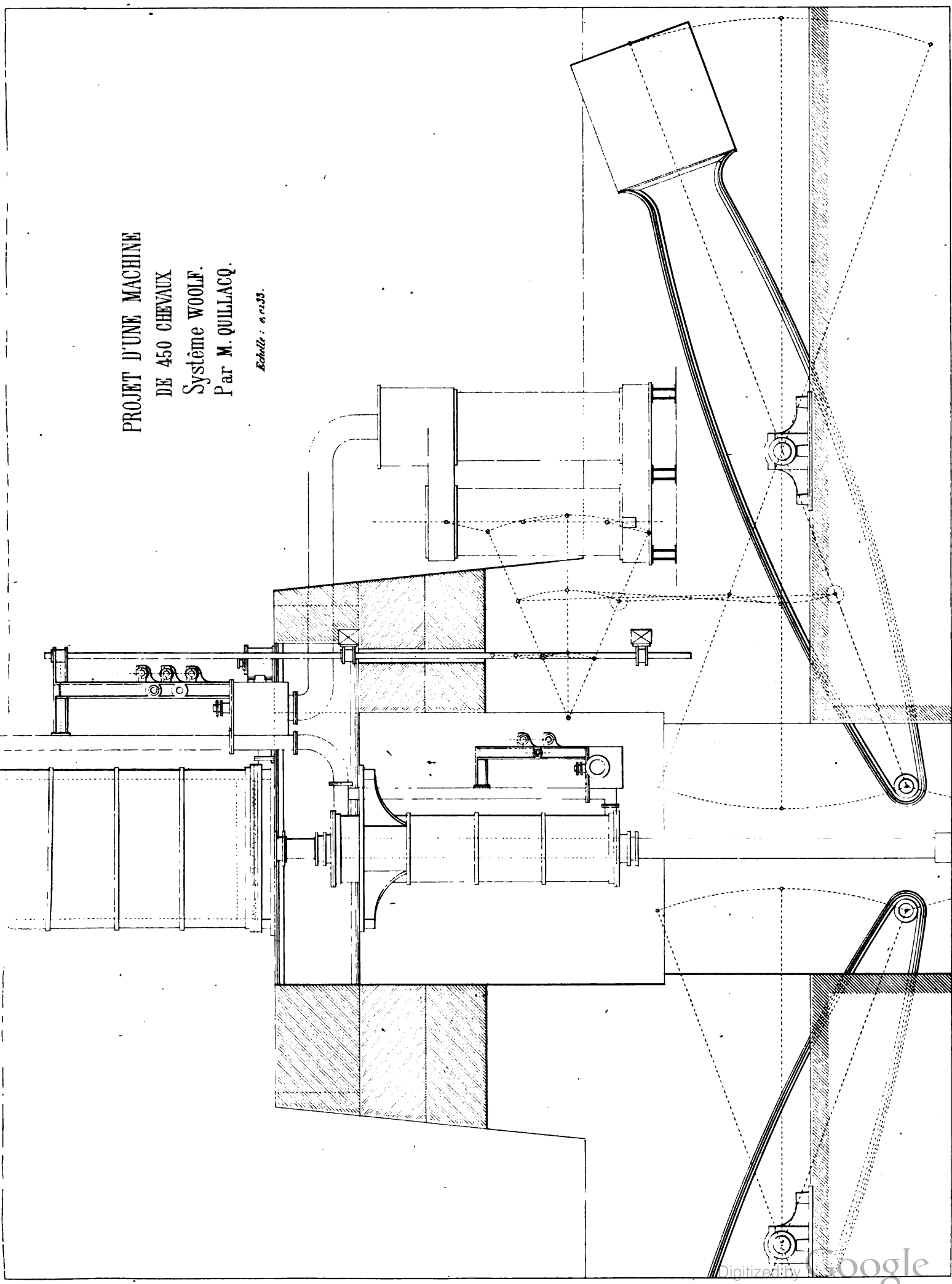
MACHINE ST. LAURENT AU CREUSOT.
INSTALLATION DES CHAUDIÈRES.

Coupe longitudinale.

Echelle: n. cr.

PROJET D'UNE MACHINE
DE 450 CHEVAUX
Système WOOLF.
Par M. QUILLACQ.

Echelle : 1/200.



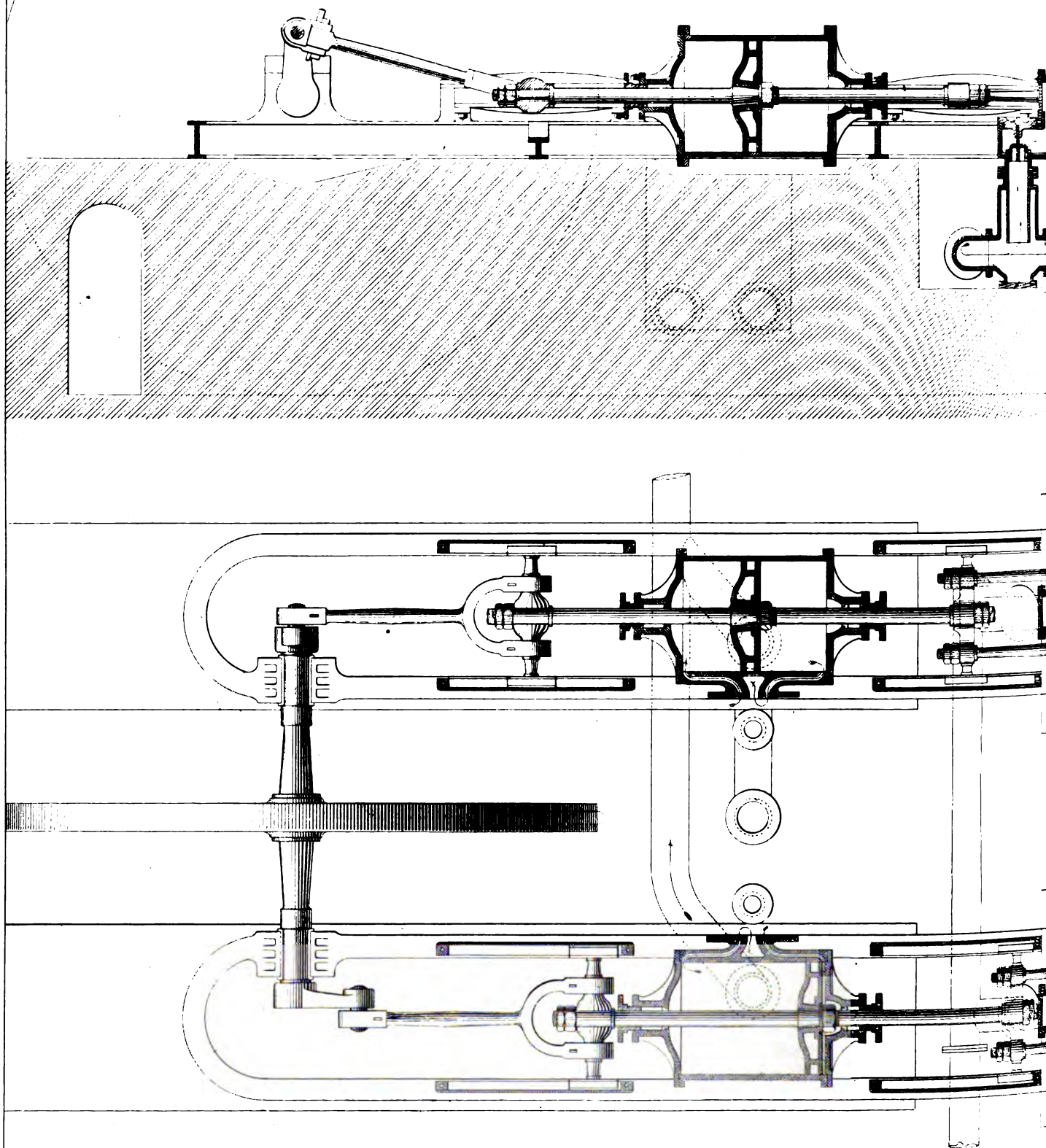
Établ. et dirigé de J. Boudry à Lyon.

MACHINE INTÉRIEURE POUR EXH

PUITS S^{TE} MARIE A 1

Projet

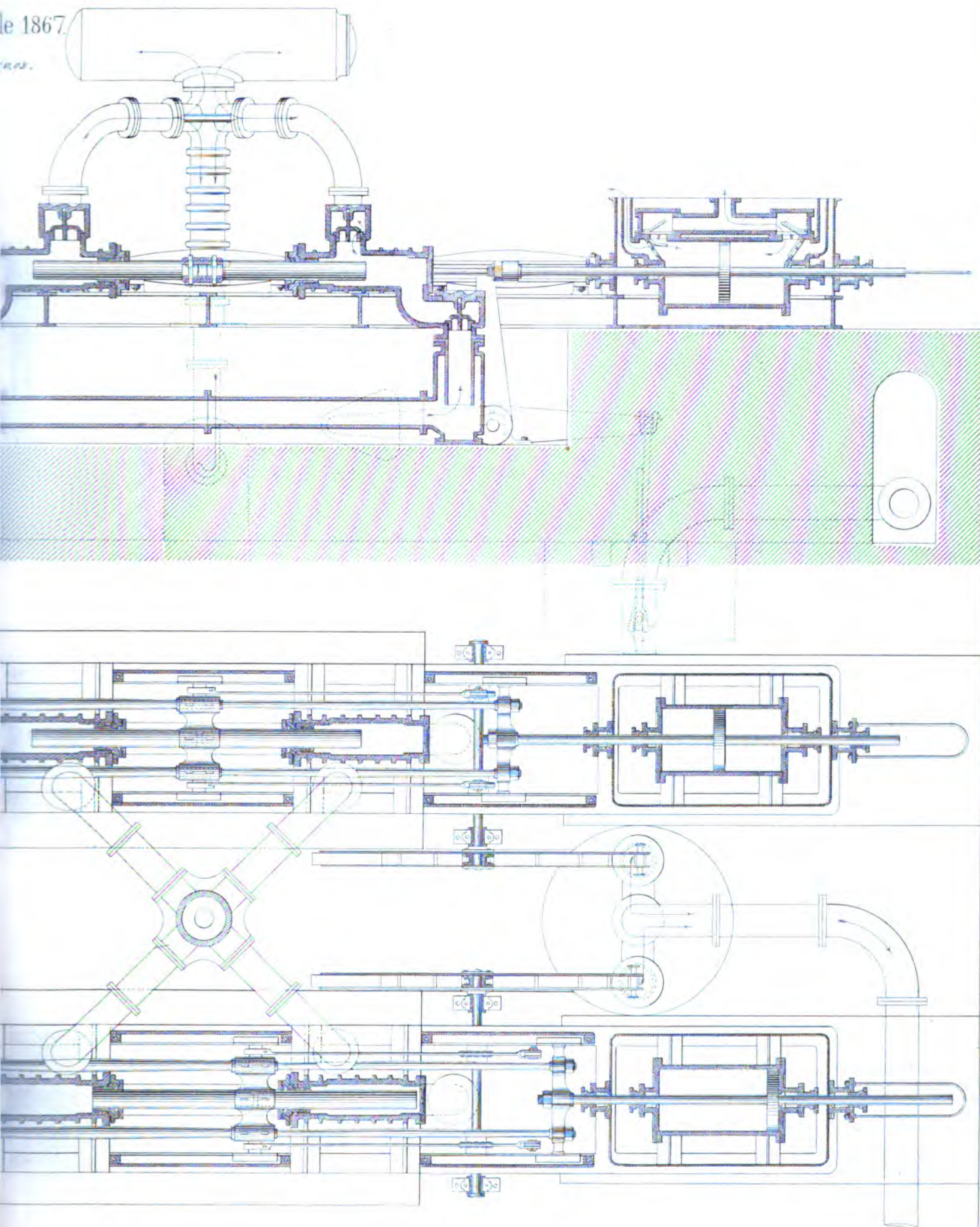
En



URE ET COMPRESSION DE L'AIR.

ONTCEAU LES MINES.

le 1867.



MACHINE S^{TE} MARIE.

Coupe par le puits des colonnes.

Échelle: 0,001.

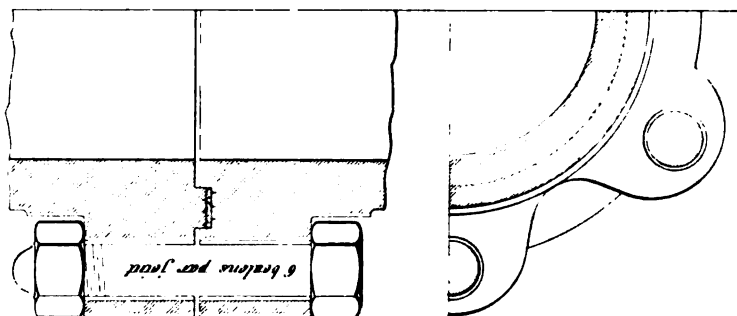
Ballon de chauffage
de la machine et de
la pompe.

Machine d'extraction.



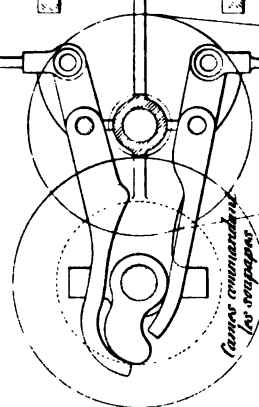
Échelle: 0,001.

Détail des joints des tuyaux.



Appareil à introduire l'air
au réservoir d'air.

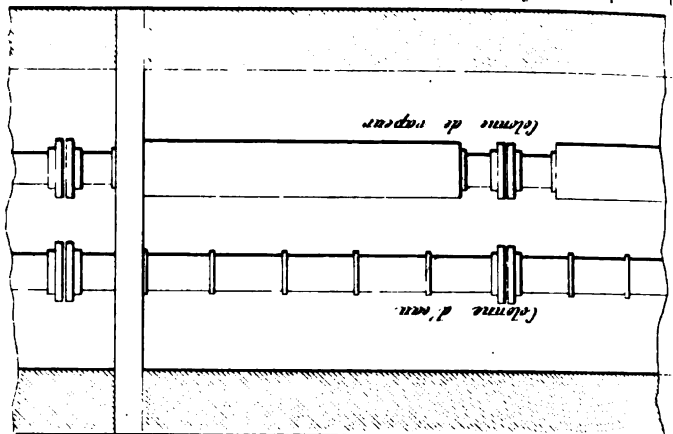
Échelle: 0,001.

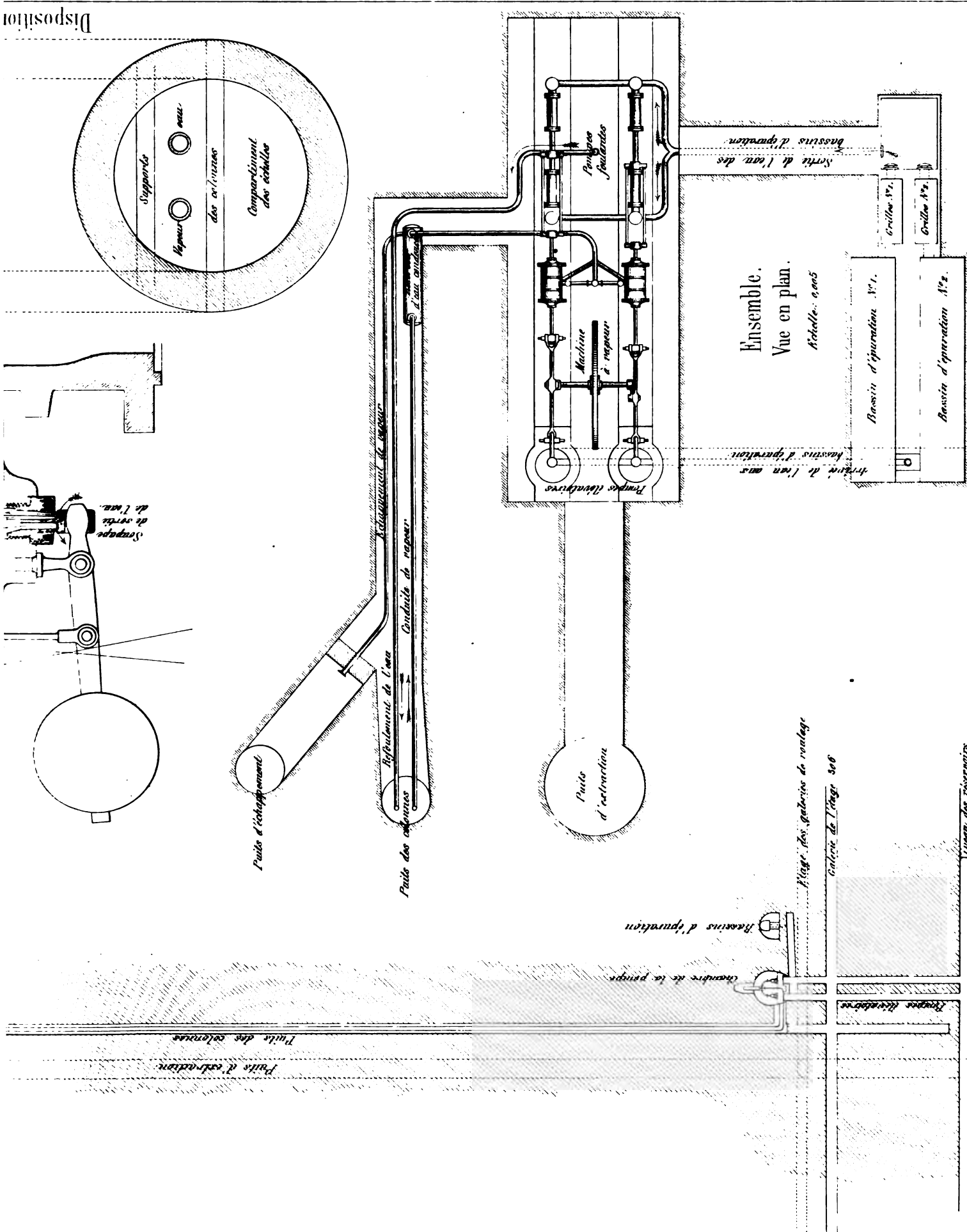


Tuyau d'entrée de l'air.

Air allant au réservoir.

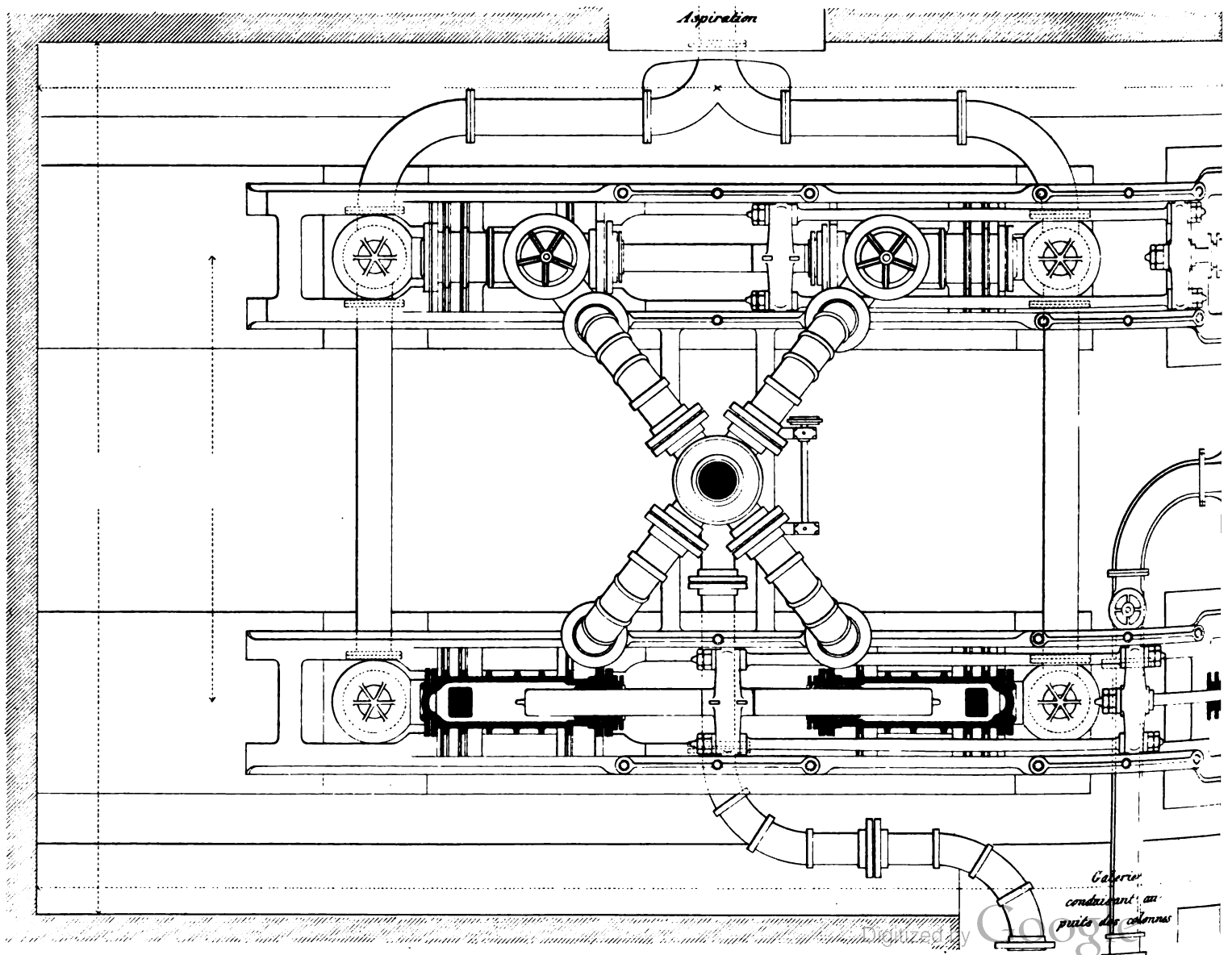
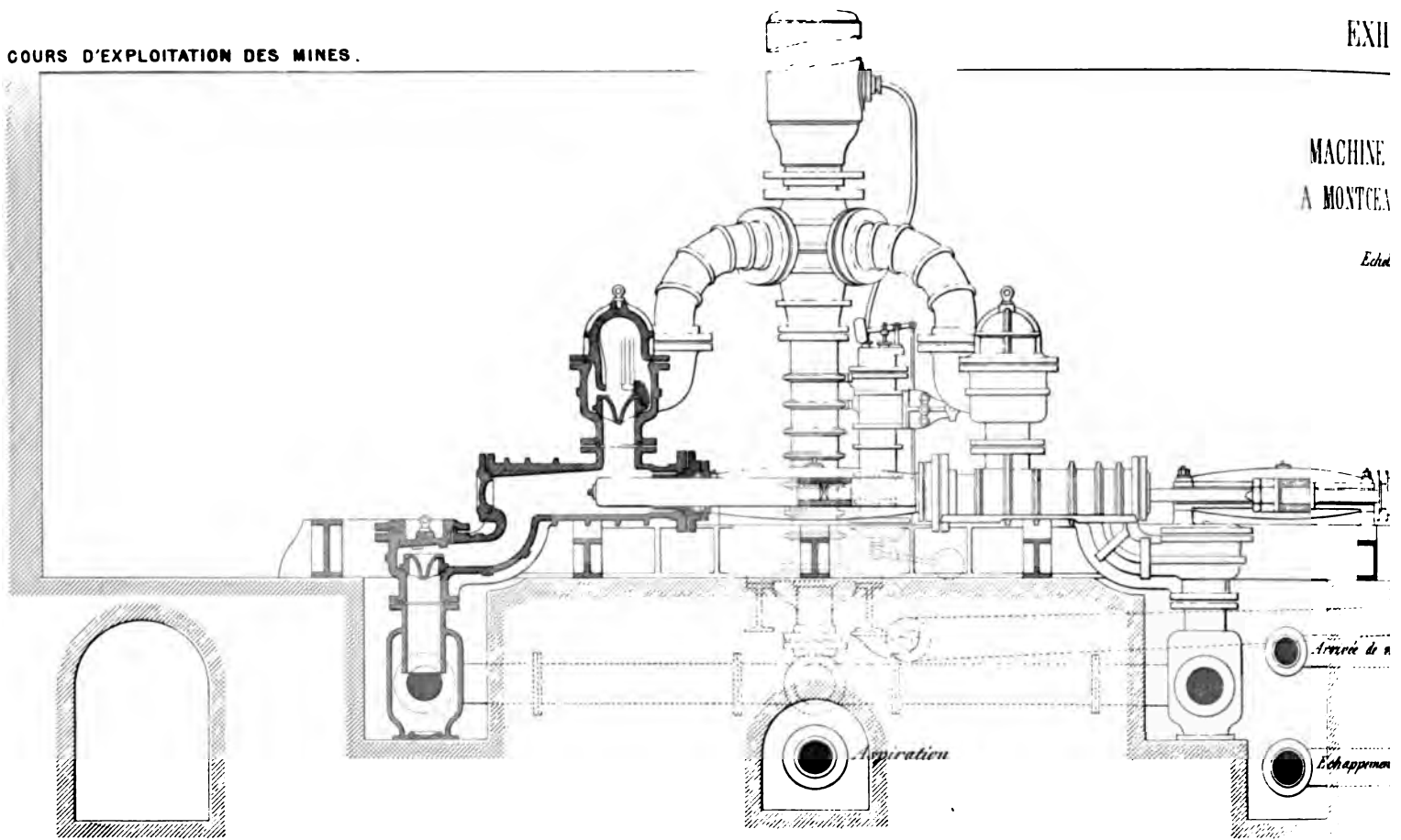
des colonnes dans le puits. Échelle: 0,001.





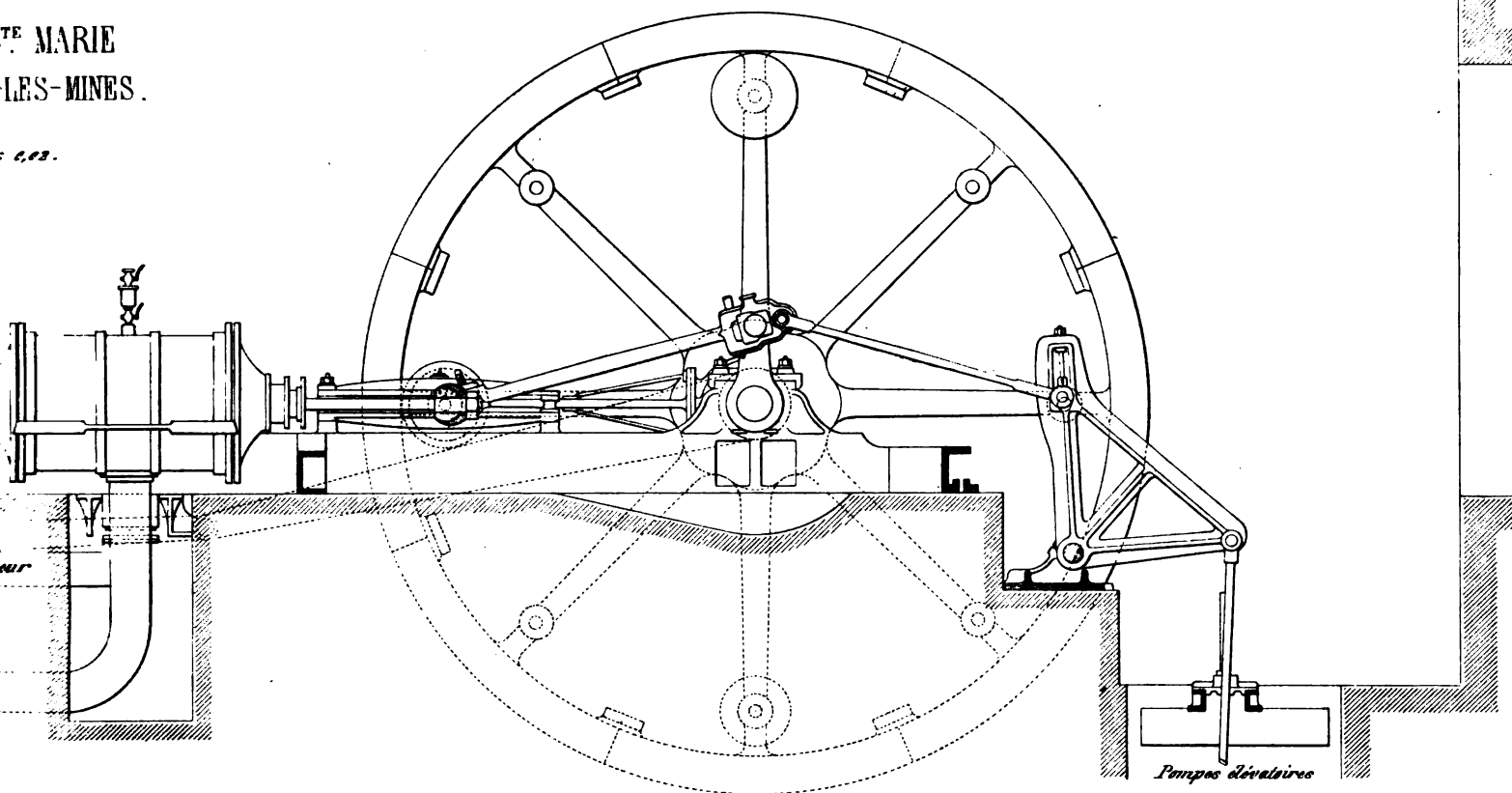
MACHINE
A MONTCEA

Echelle

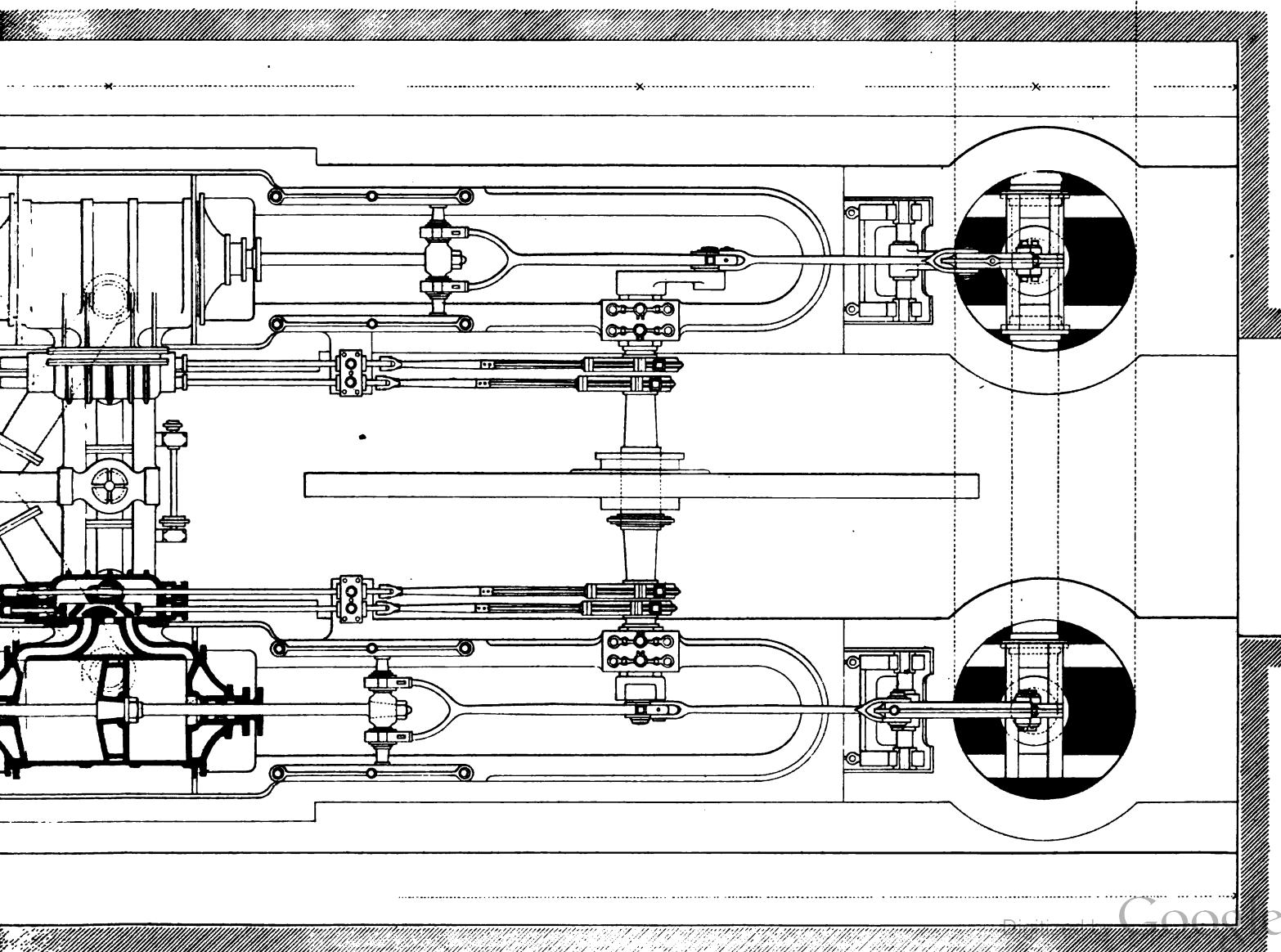


TE MARIE
LES-MINES.

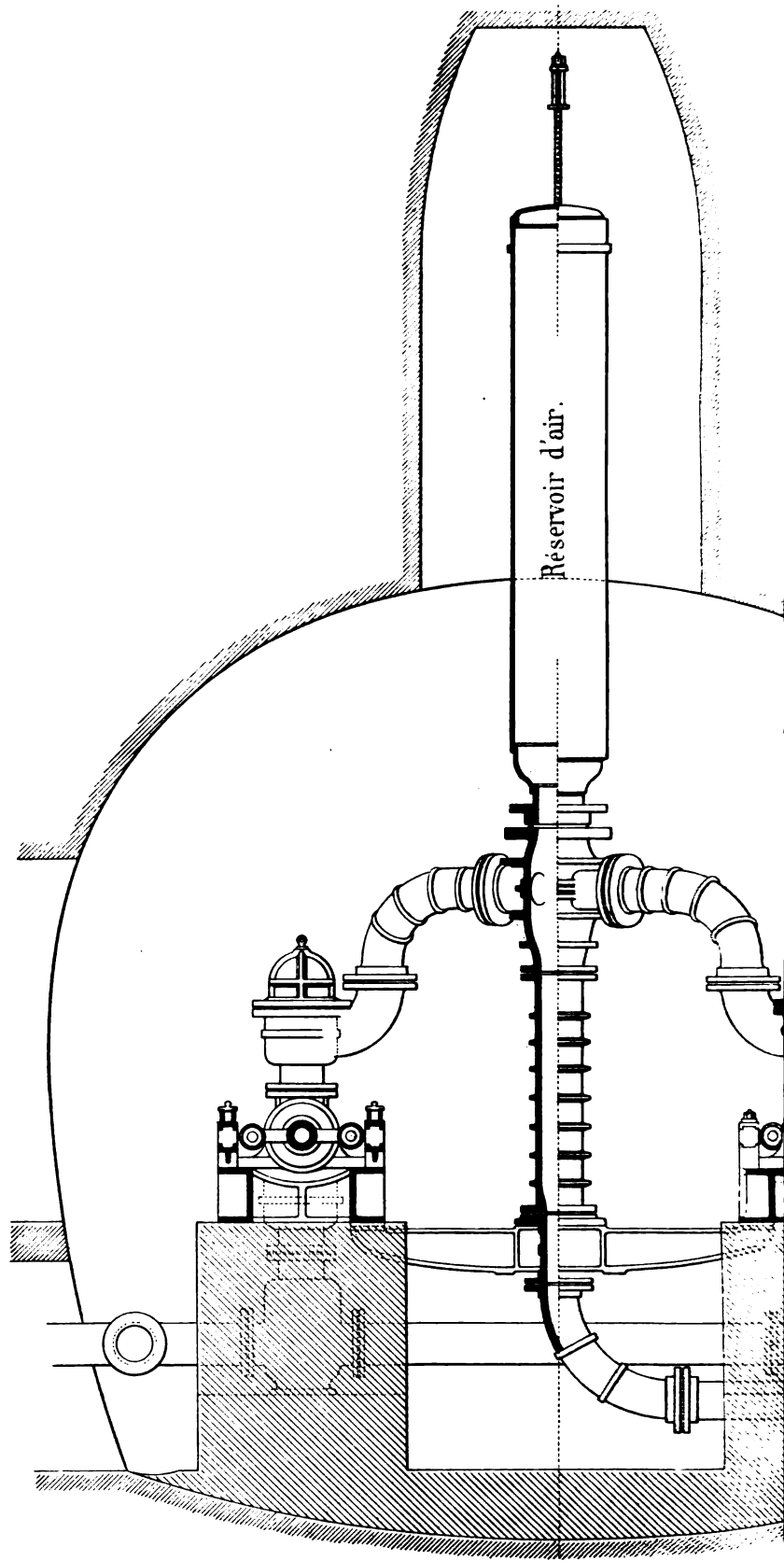
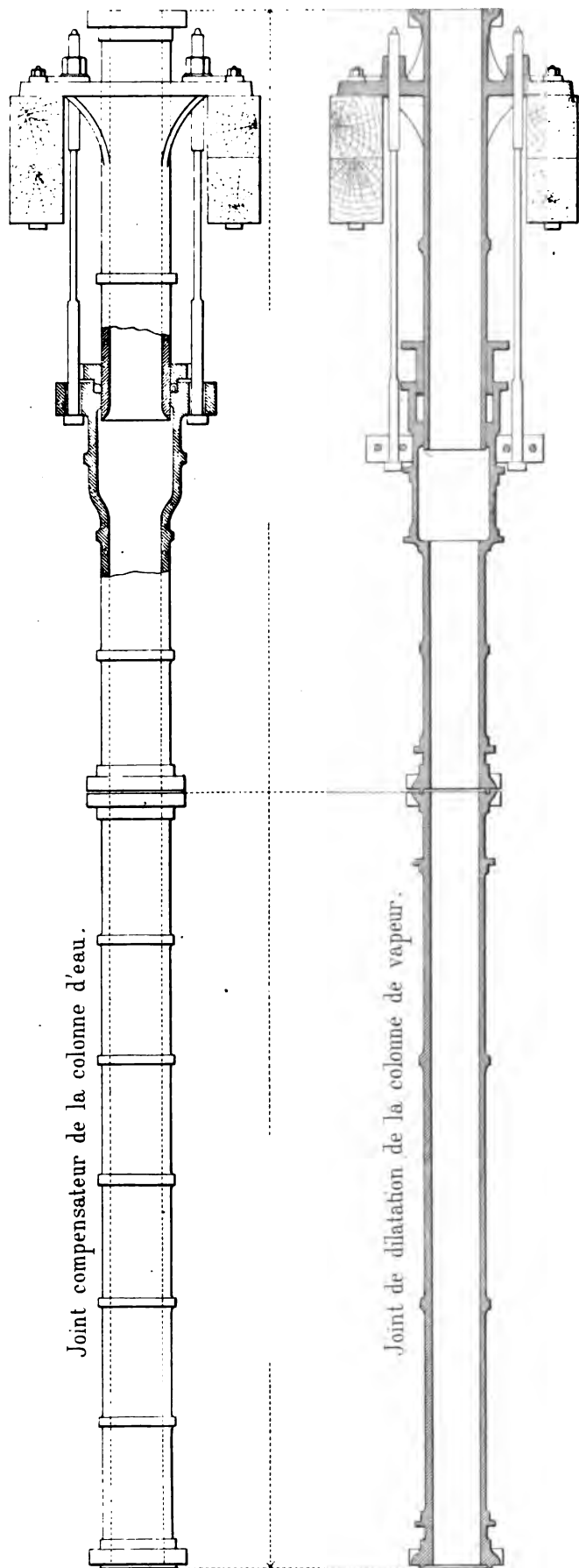
c. 23.



Pompes élévatoires



MACHINE ST^E MARIE, A

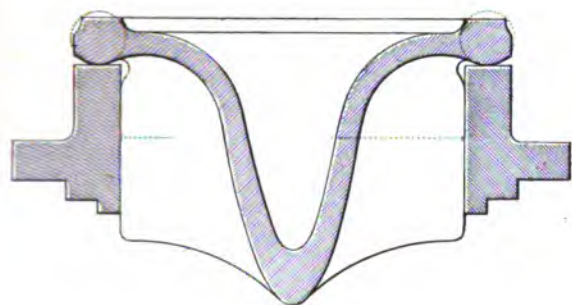
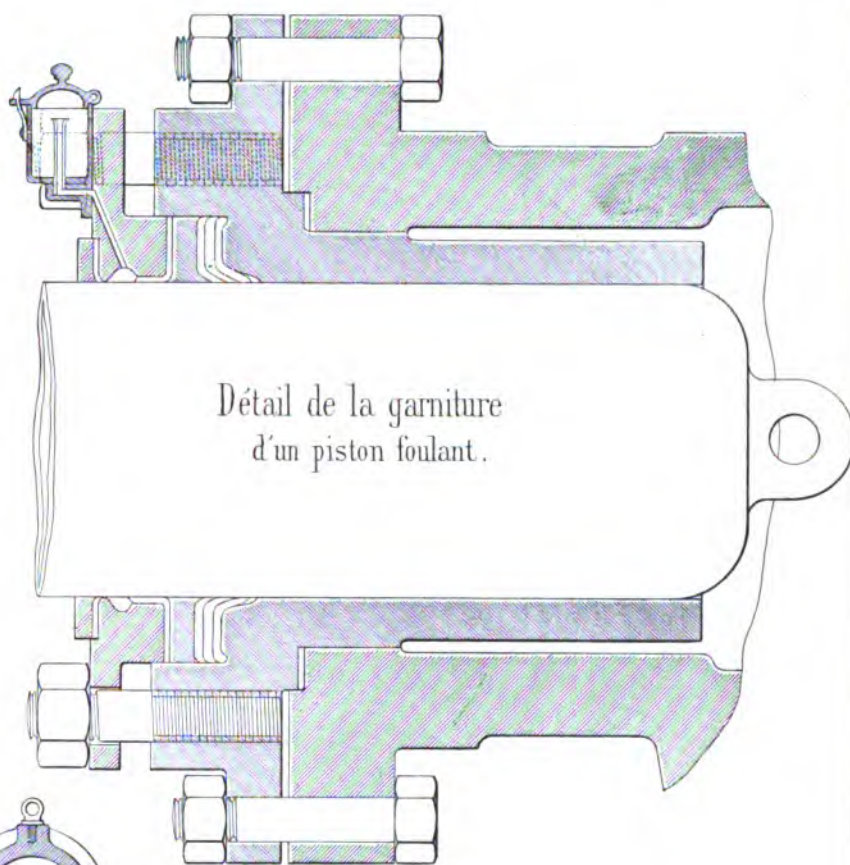


Coupe transversale.

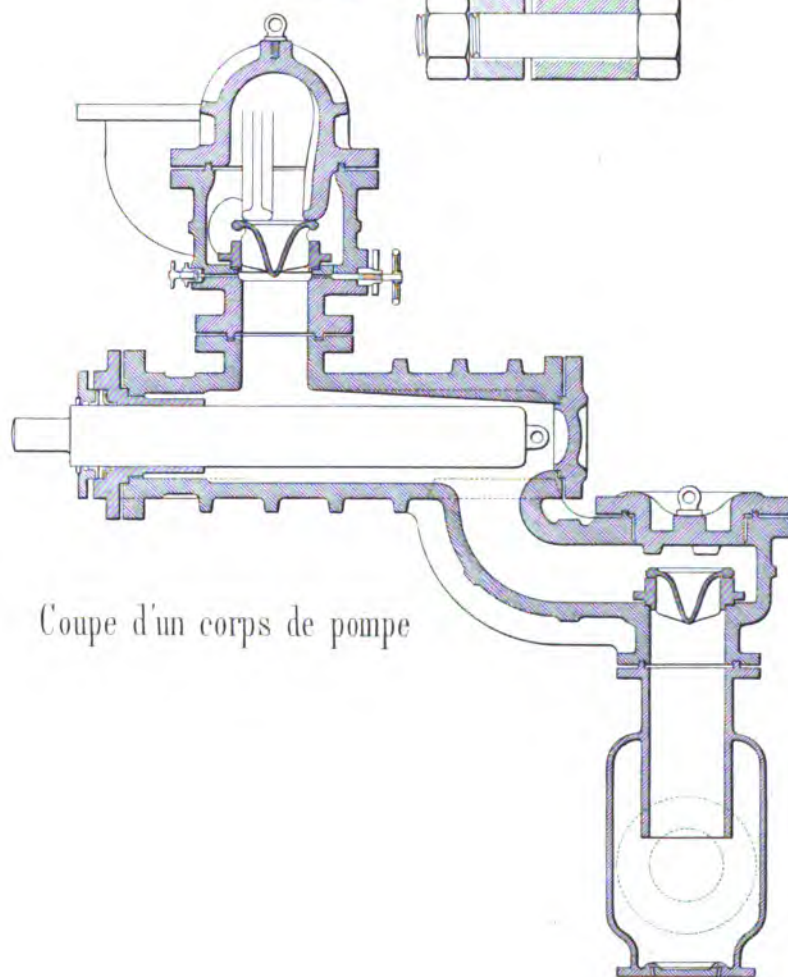
Echelle 1/20.

MONTCEAU-LES-MINES.

Détail d'une soupape.

Détail de la garniture
d'un piston foulant.

Coupe d'un corps de pompe



FOSSE DE BELLEVUE, A JUMET. (CHARLEROY.)

Ech: 0,004.

Fig. 1.

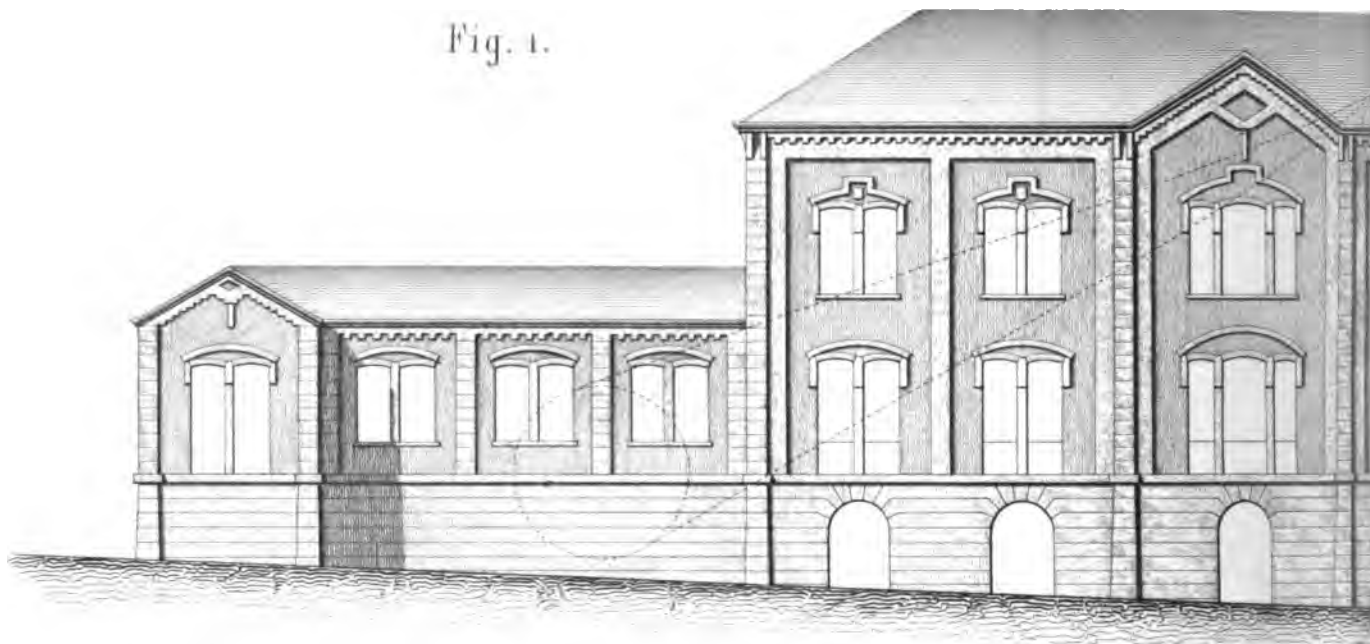


Fig. 2. FOSSE LE BRET A DENAIN.

Ech: 0,005.

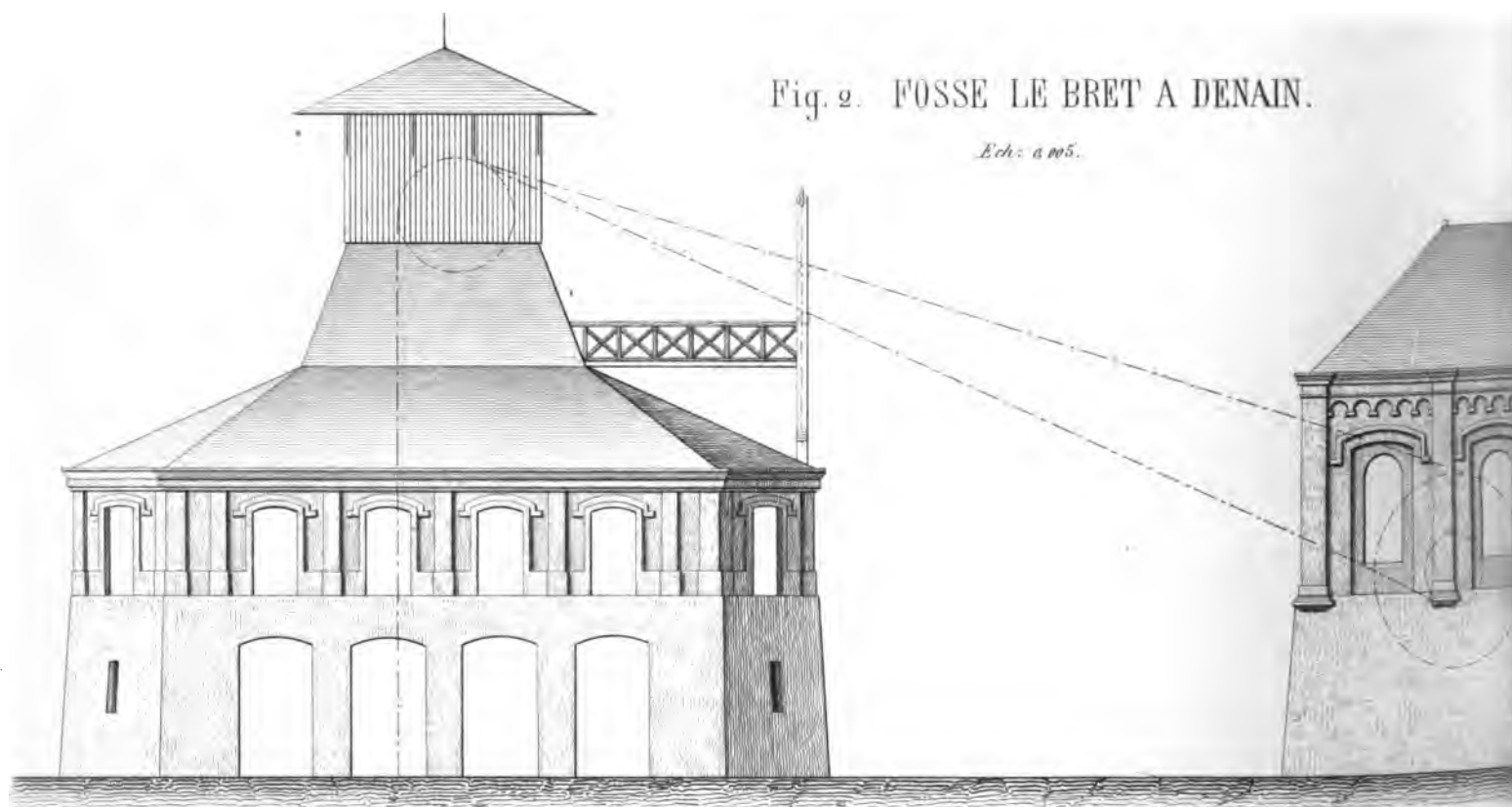


Fig.3. Coupe du chevalement
de la fosse LE BRET.

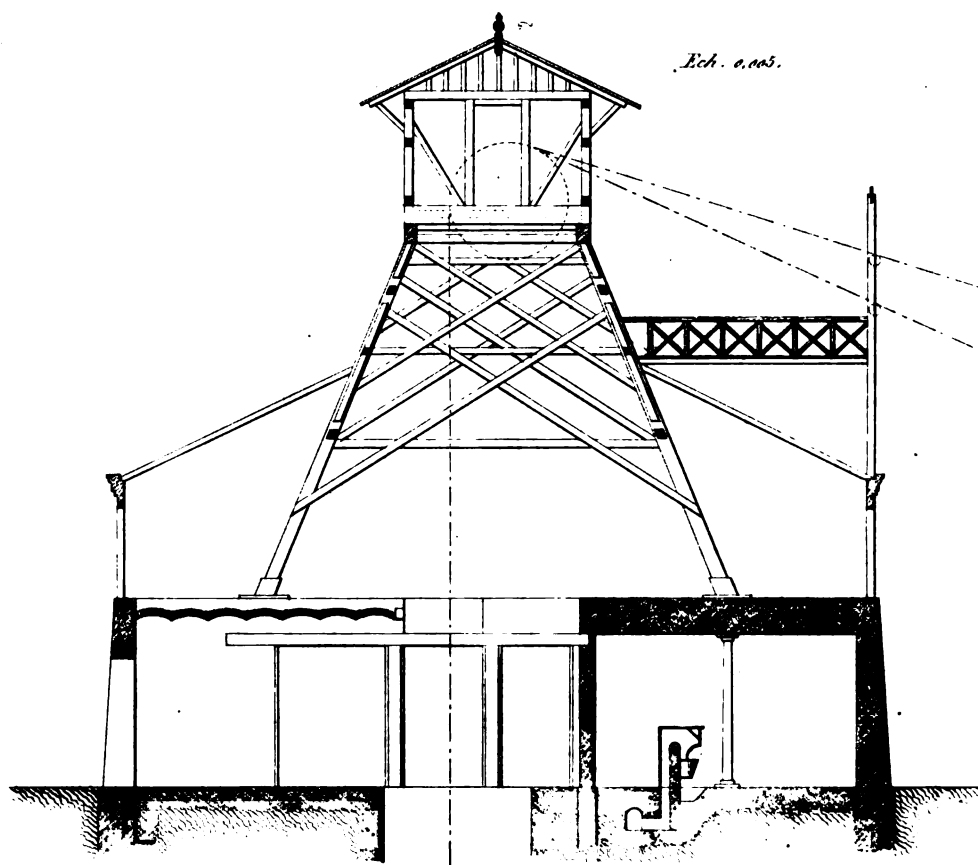
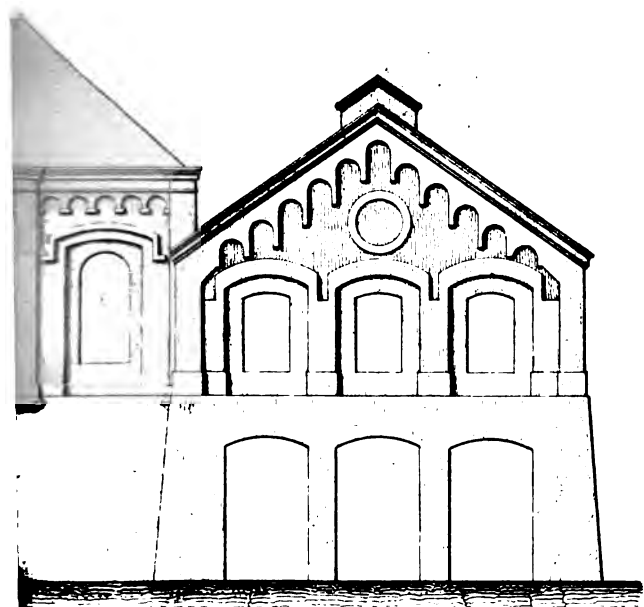
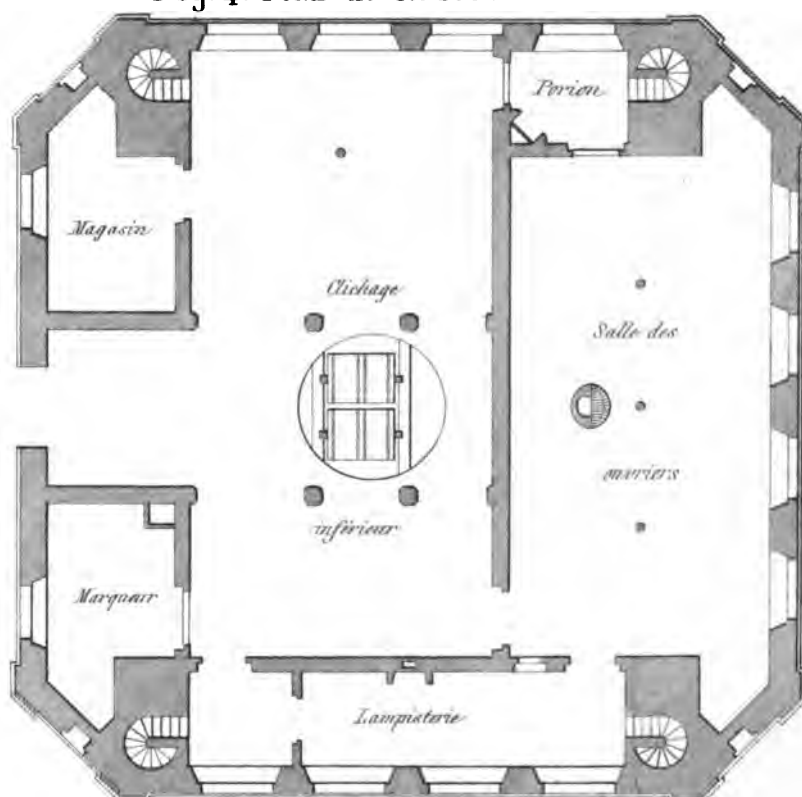
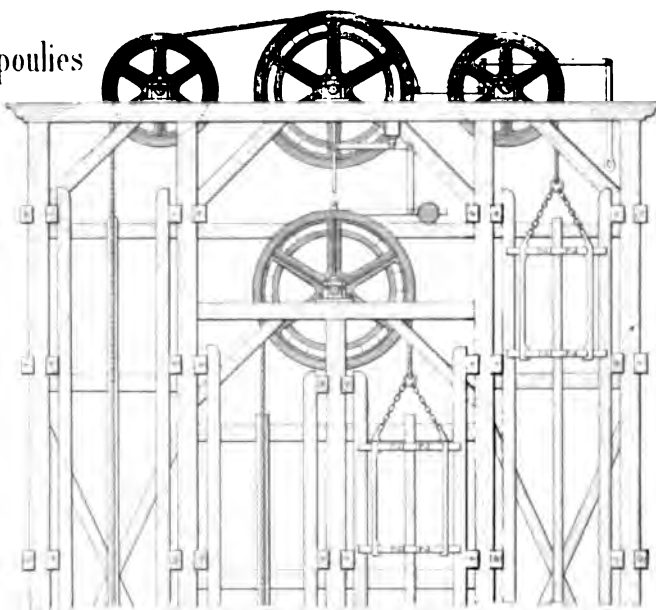


Fig.4. Plan de la fosse LE BRET.

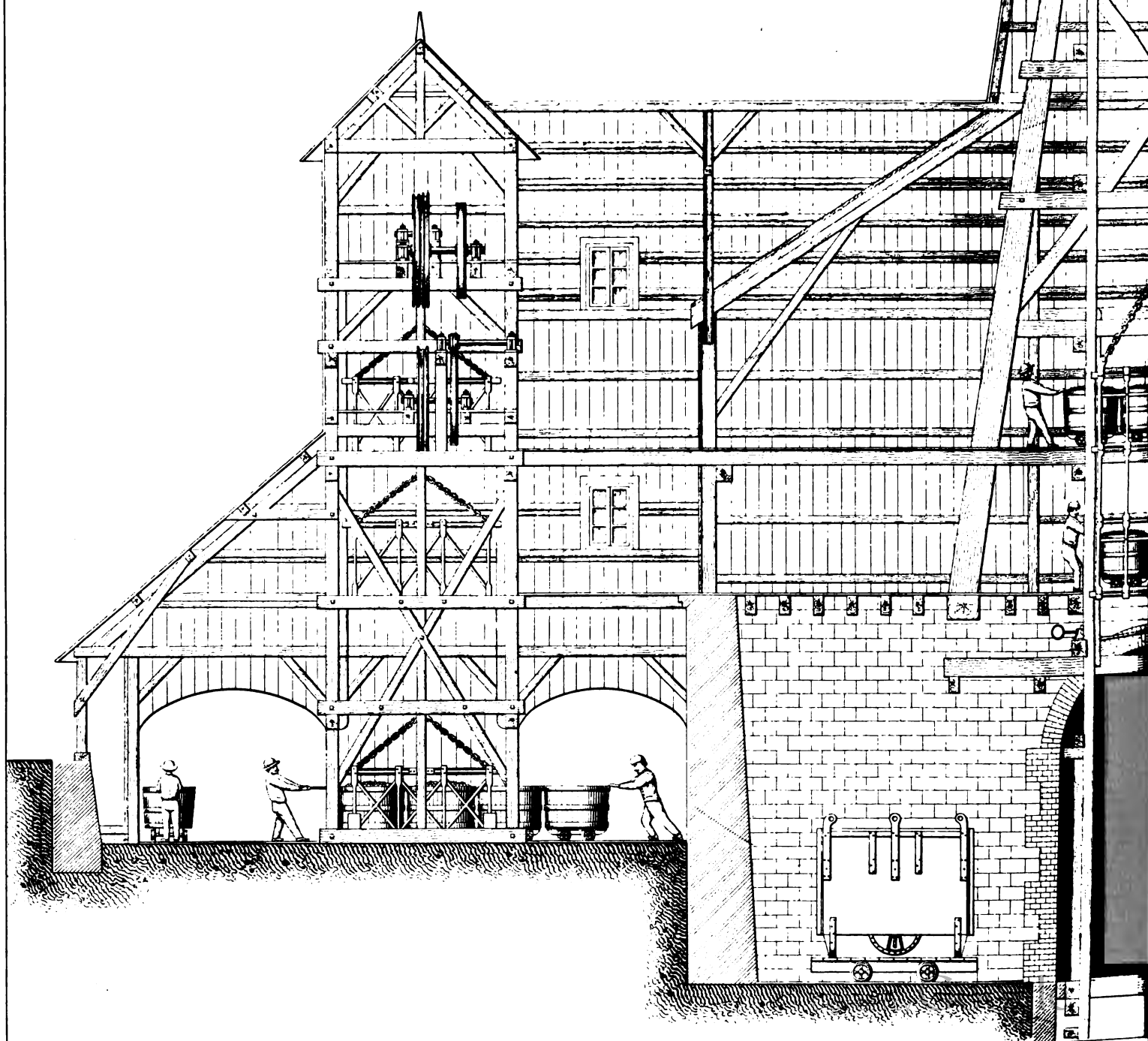


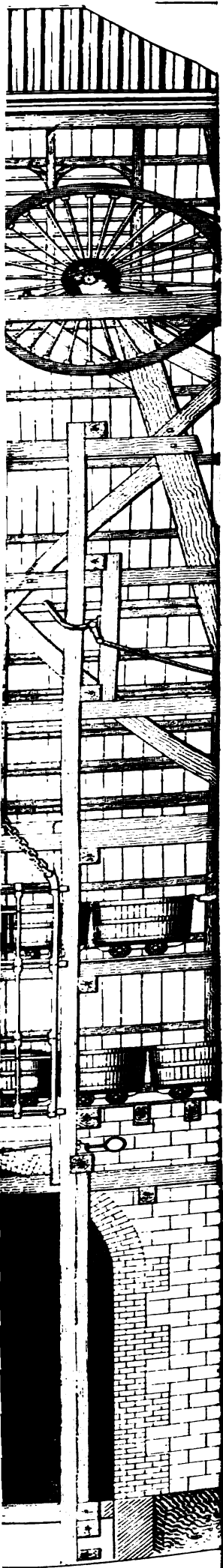
Disposition des poulies
de la balance.



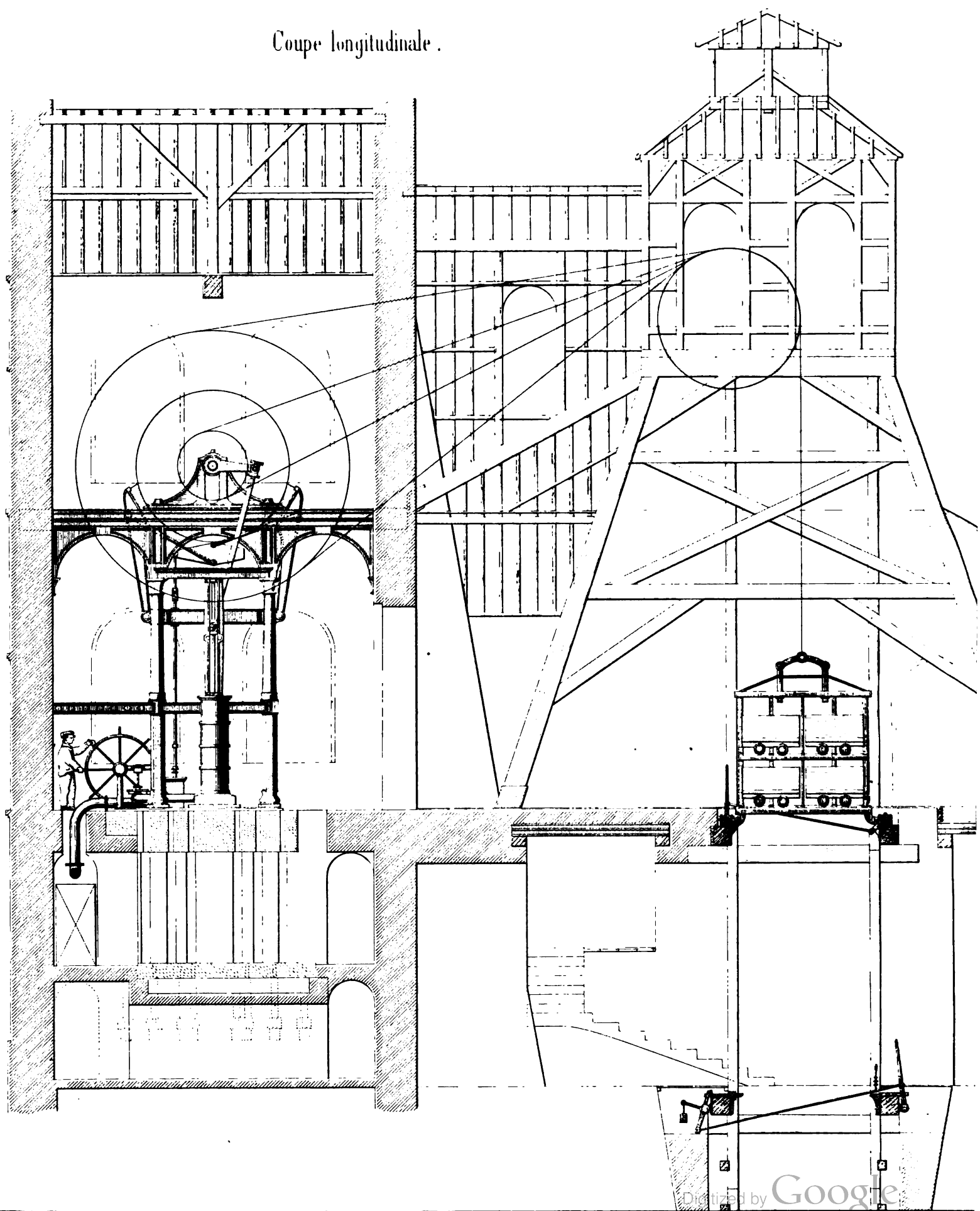
Niveau de la recette supérieure.

Niveau de la recette inférieure.





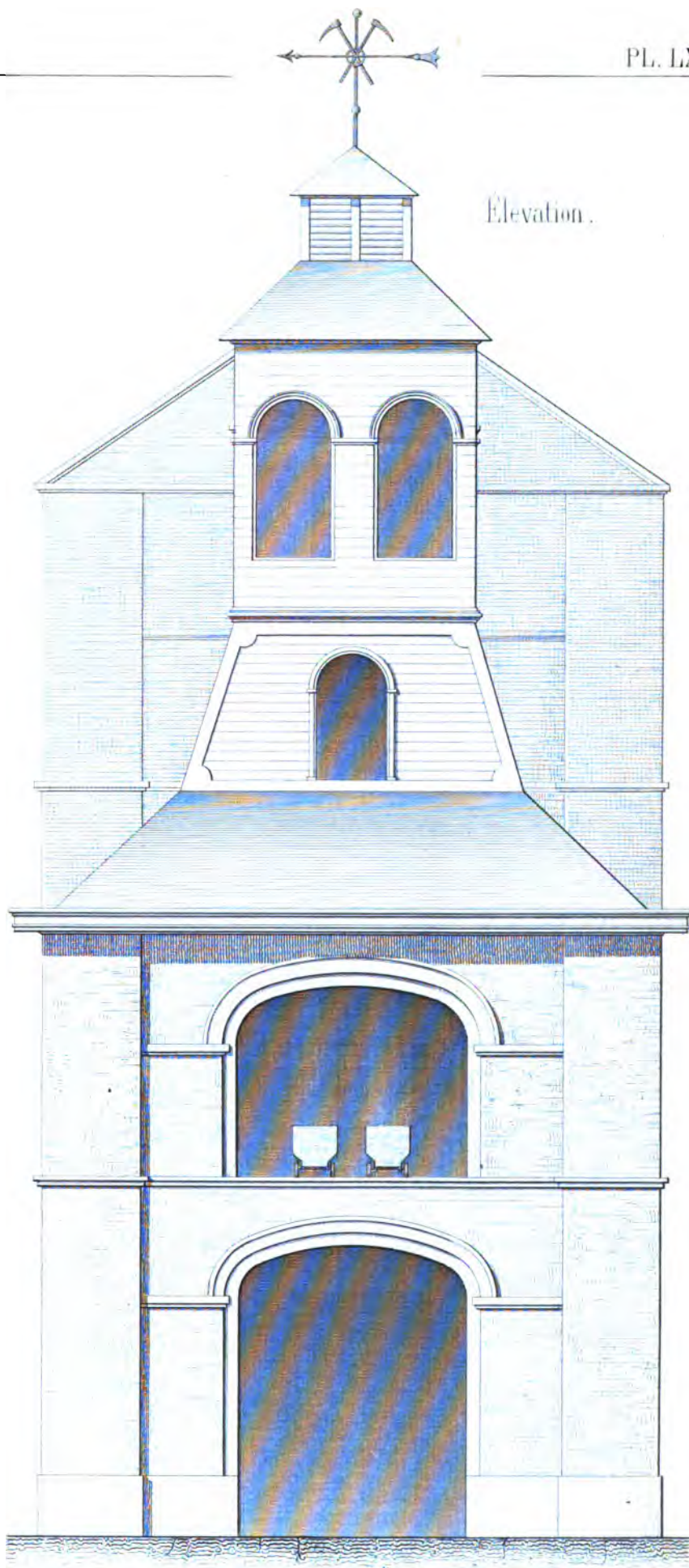
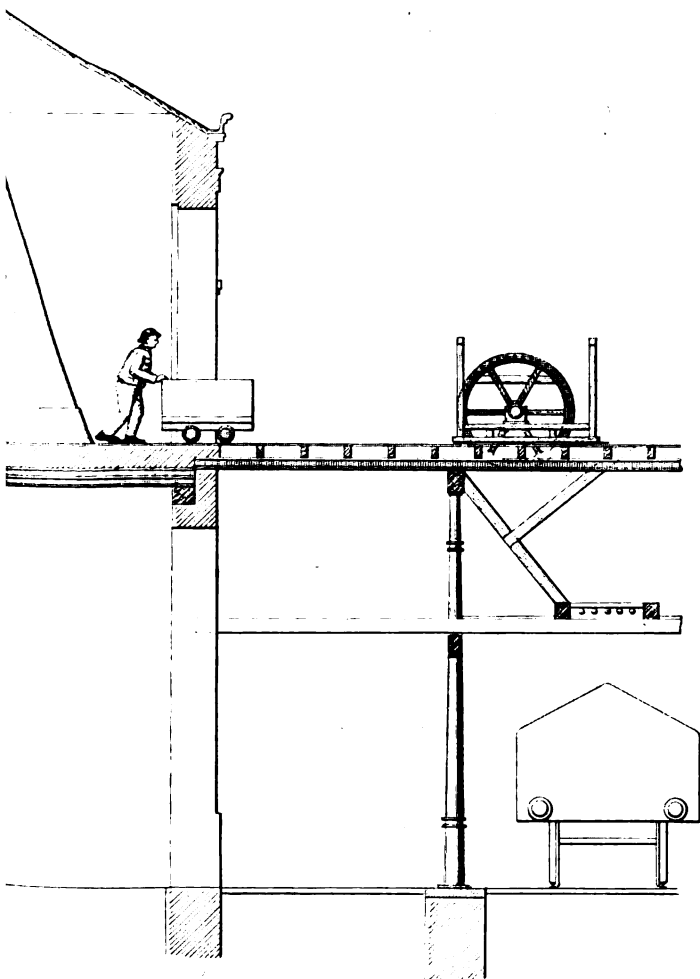
Coupe longitudinale.

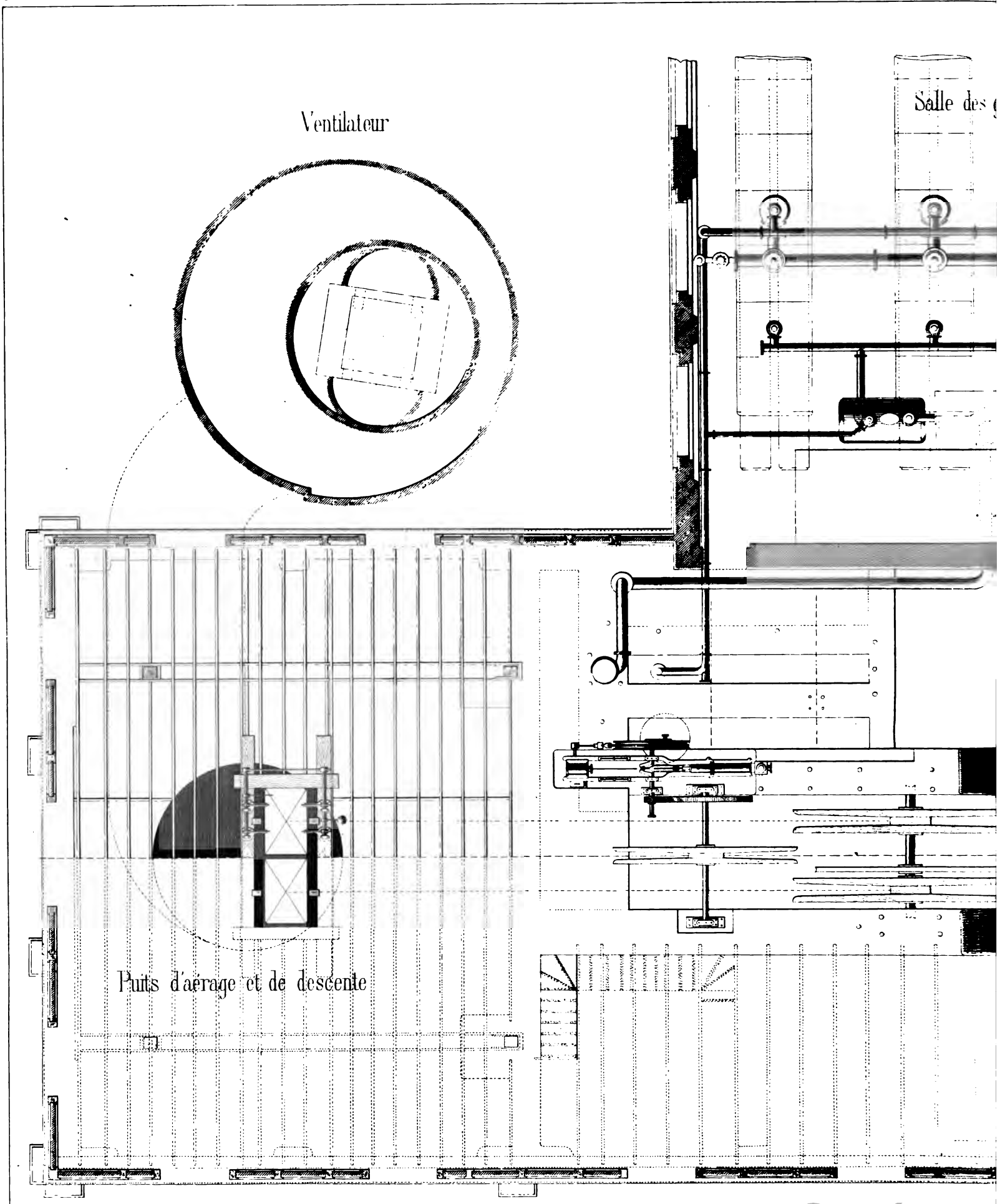


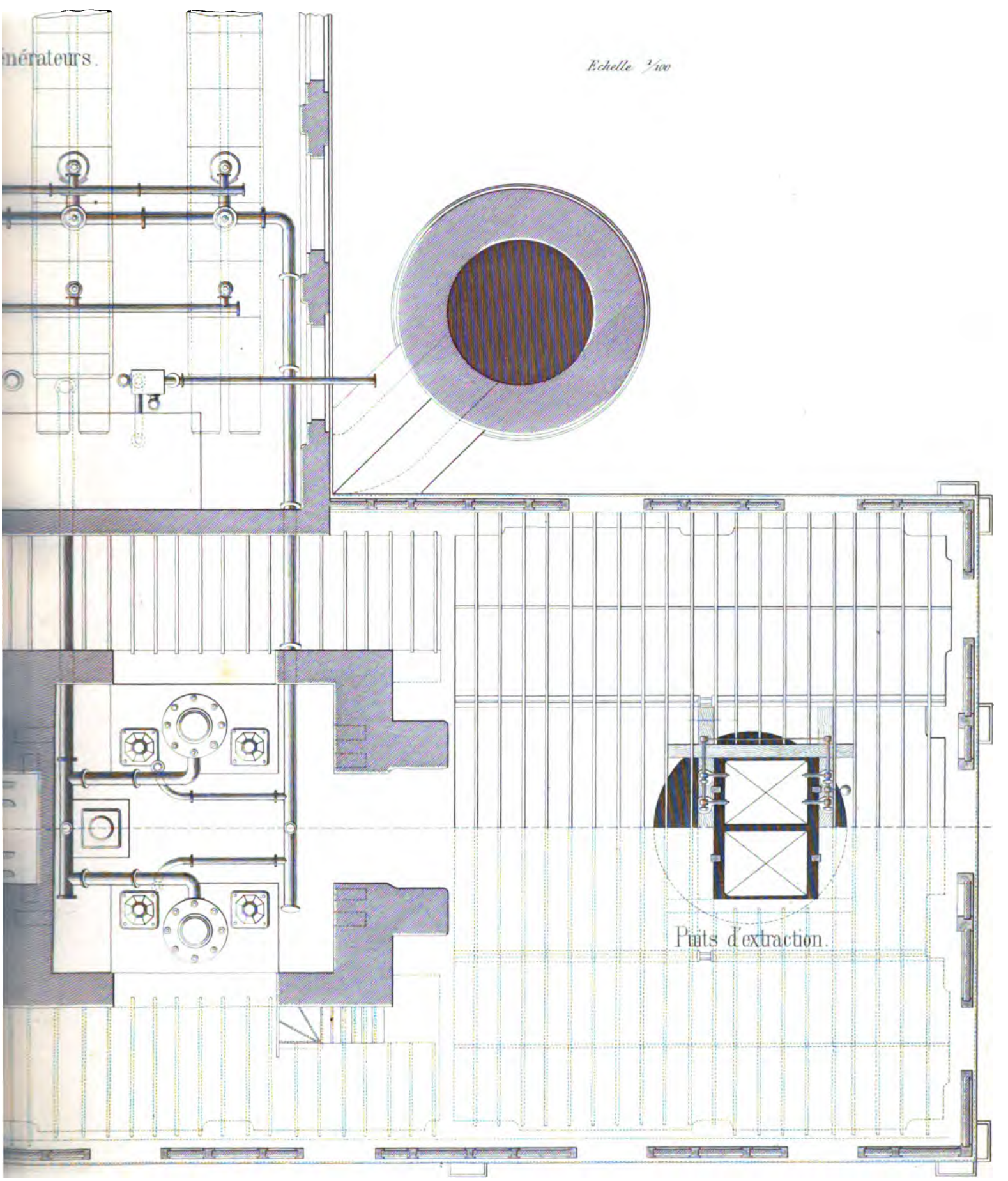
FOSSE DE NŒUX, N° 4.

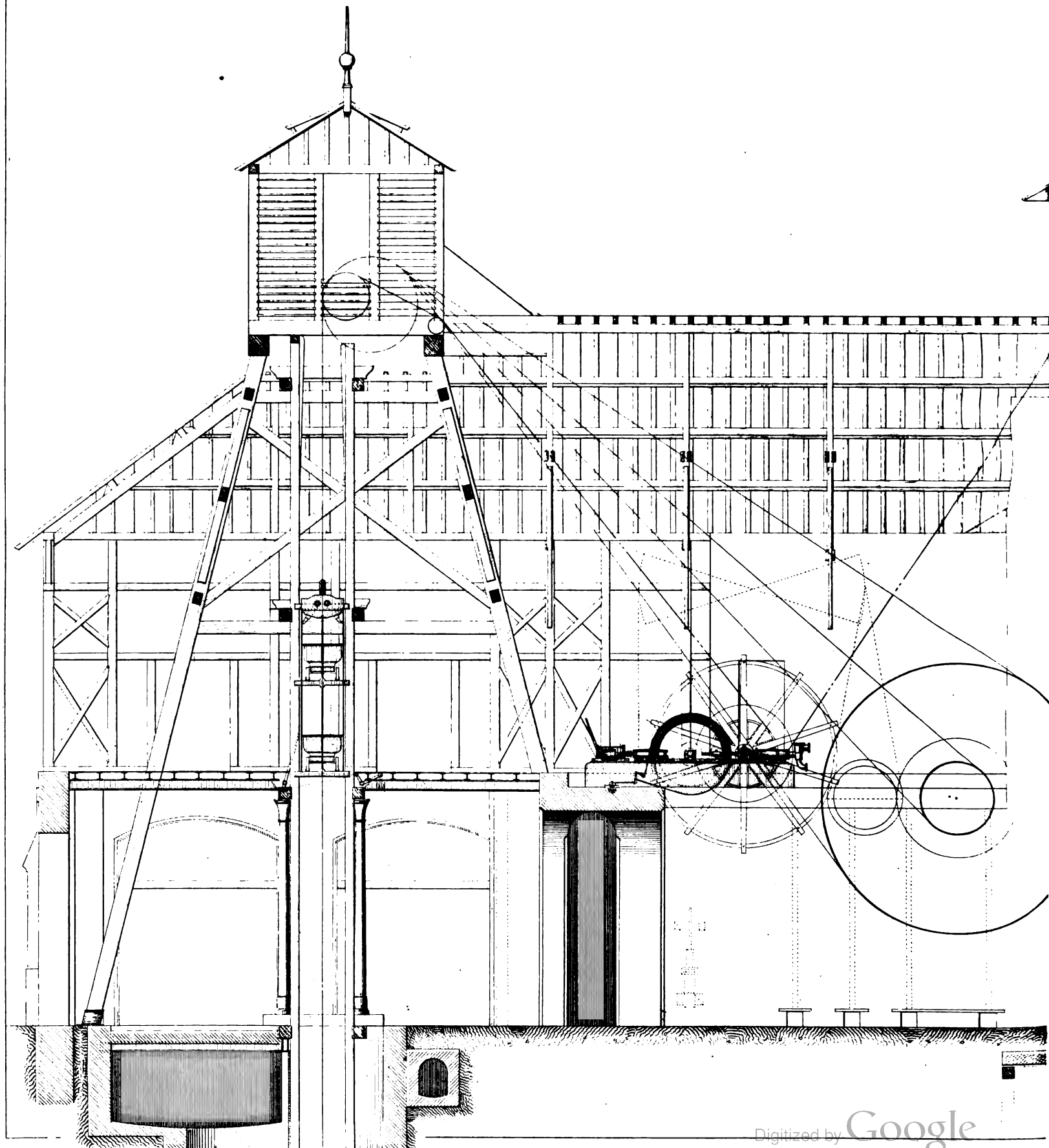
Echelle $\frac{1}{100}$

Elevation.



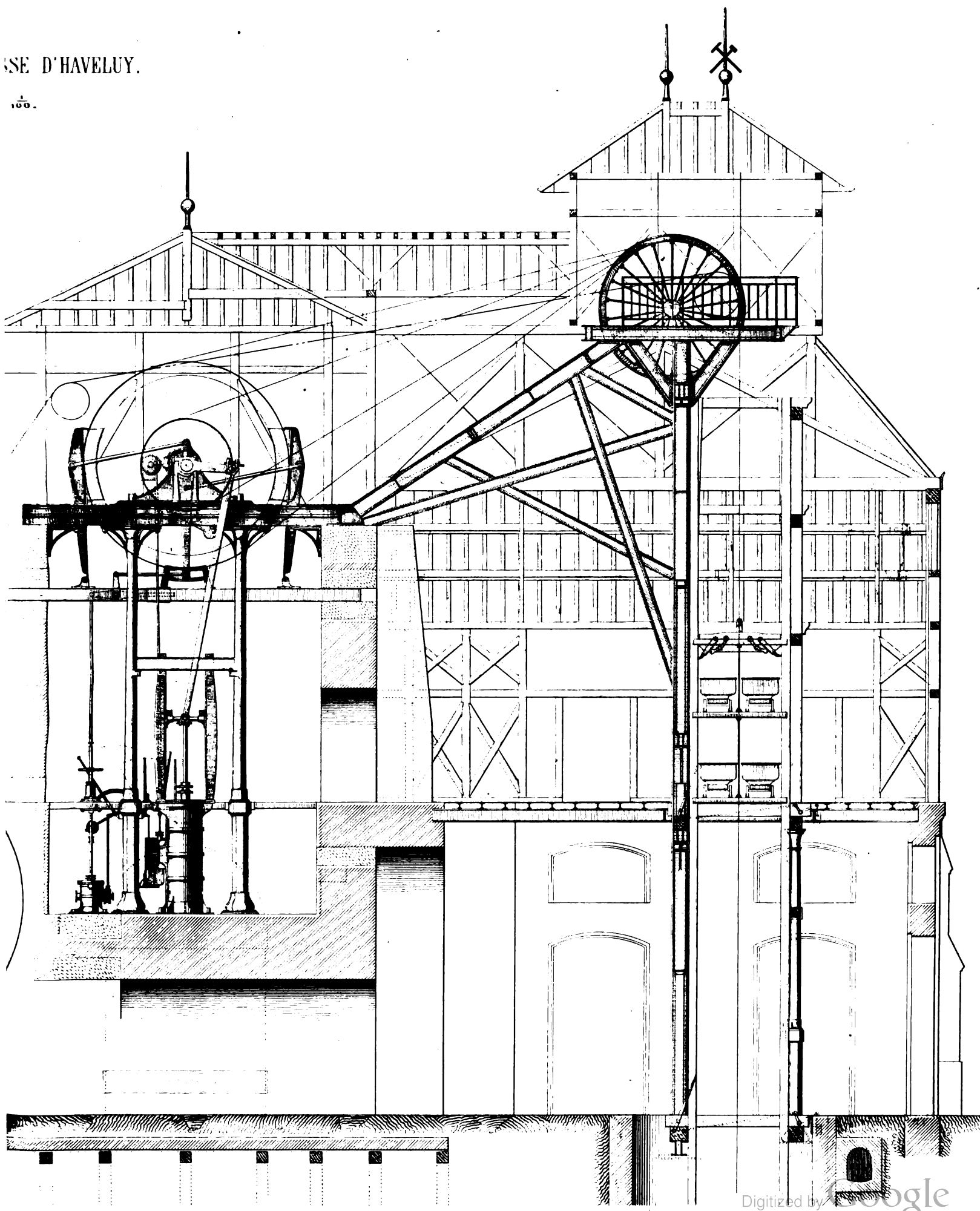


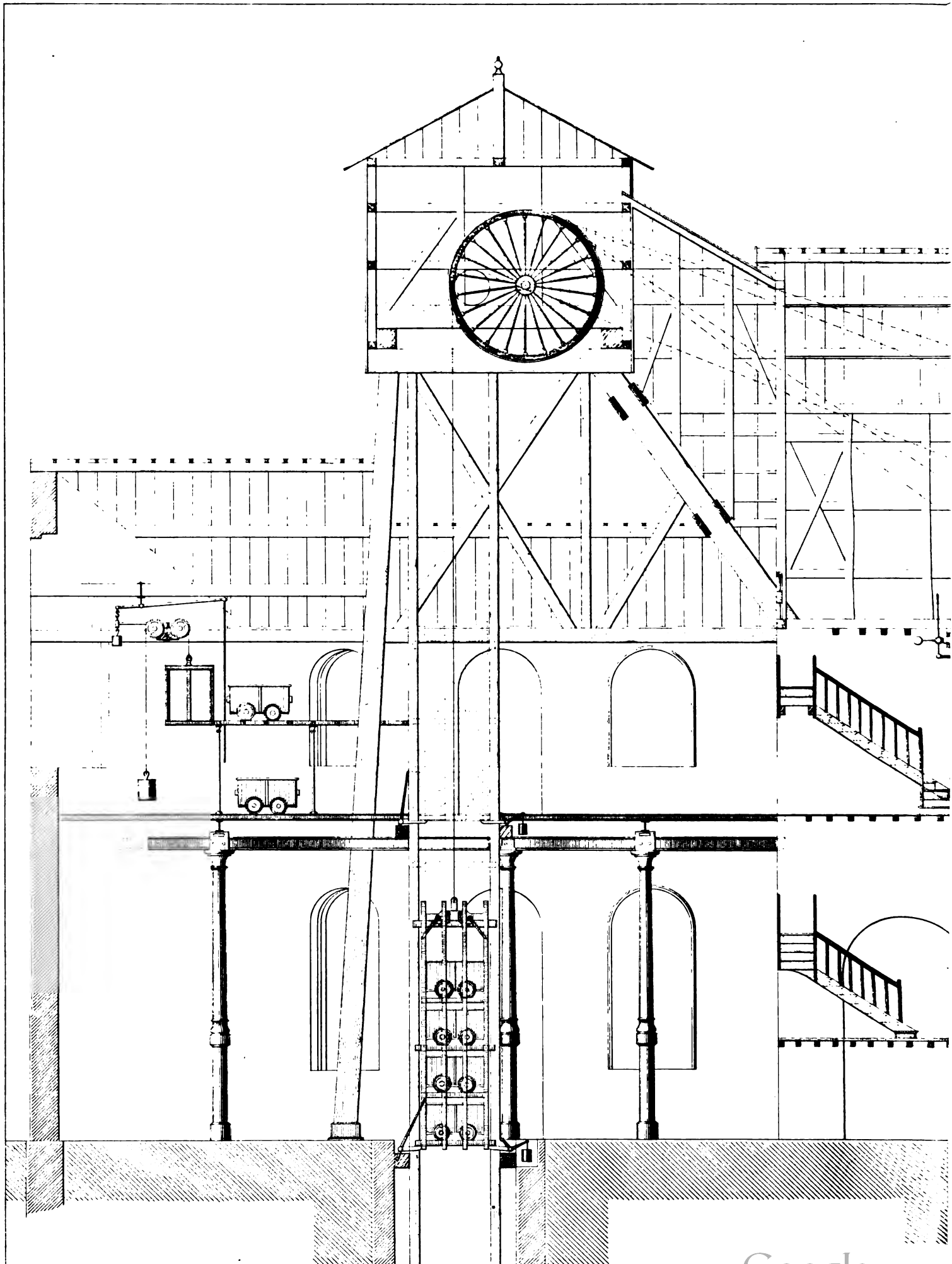




SE D'HAVELUY.

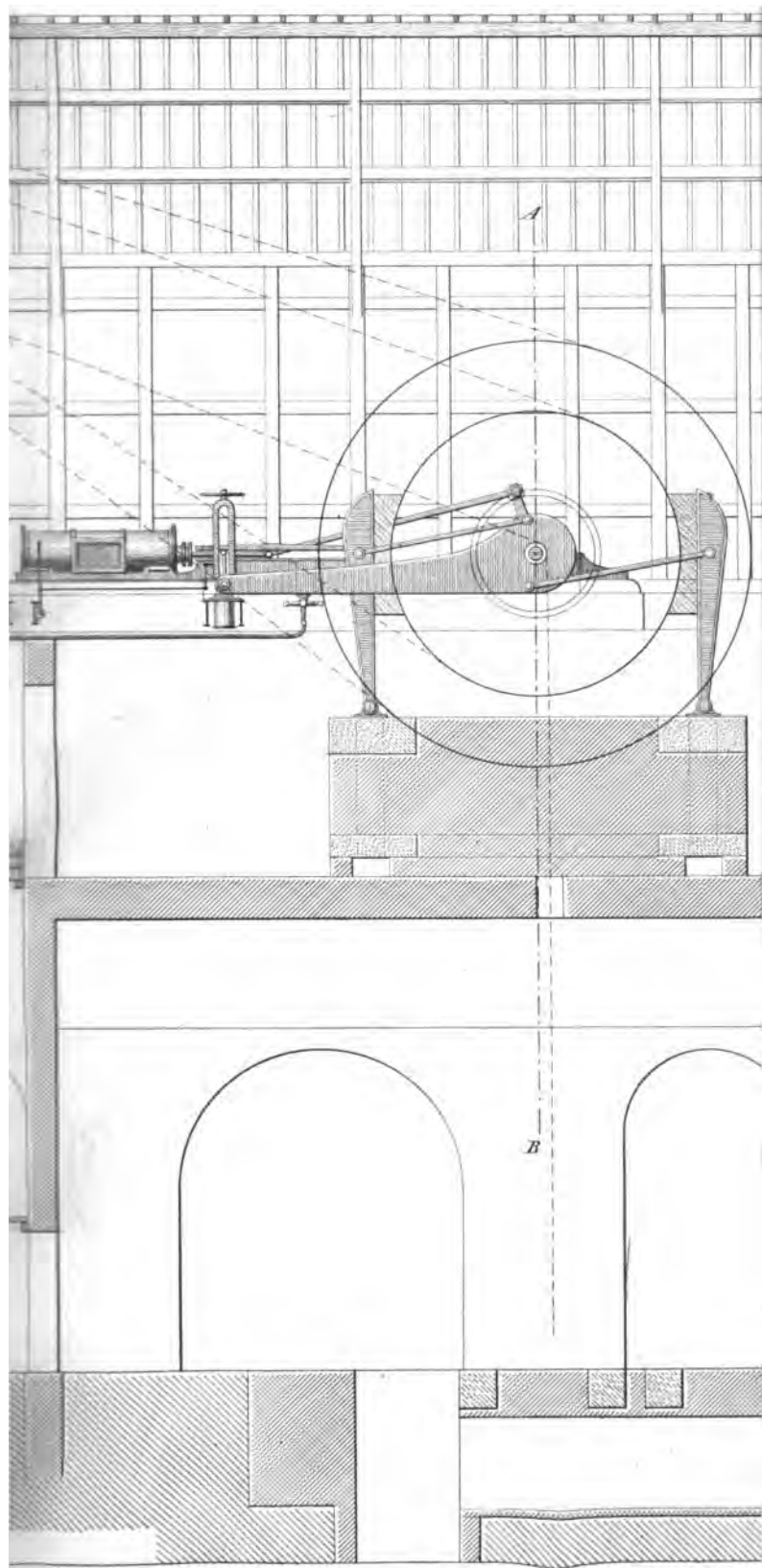
100.





C^{IE} D'ANZIN. FOSSE ST MARK.

Echelle $\frac{1}{100}$.



Établ^t et imp^{re} de J. Baudry, à Liège.

Fig. 4.
Plan du clichage.
Ech. $\frac{1}{50}$.

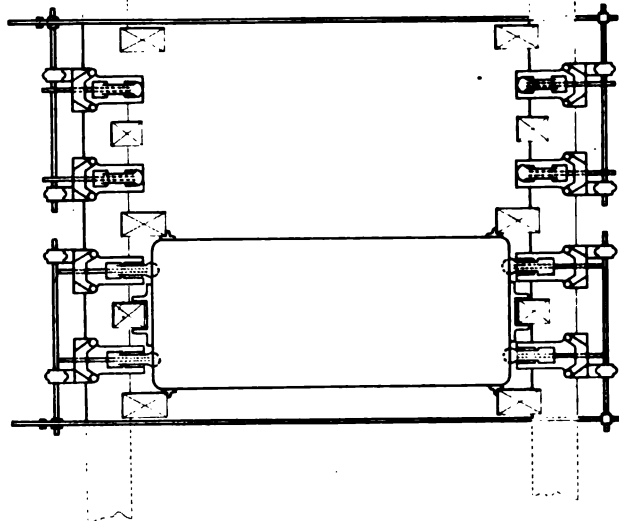


Fig. 5.
Cage sur le clichage.
Ech. $\frac{1}{50}$.

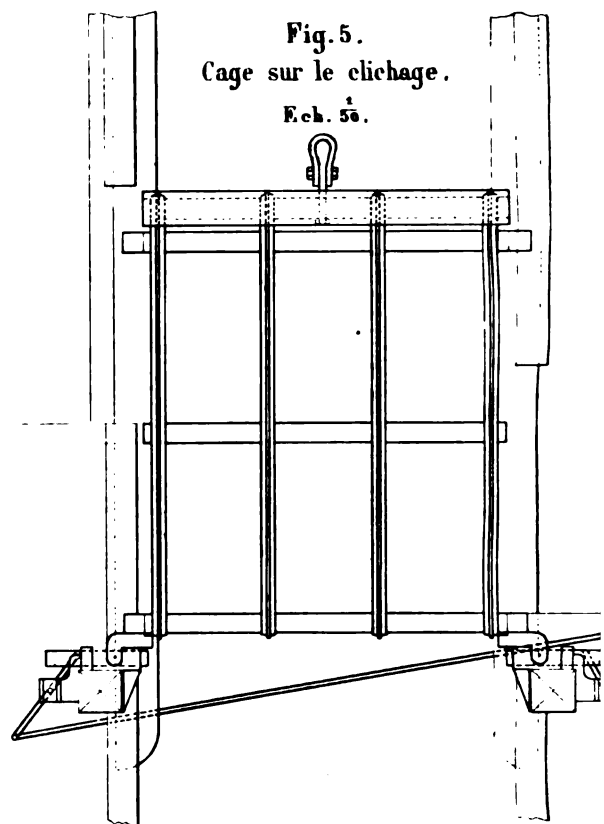
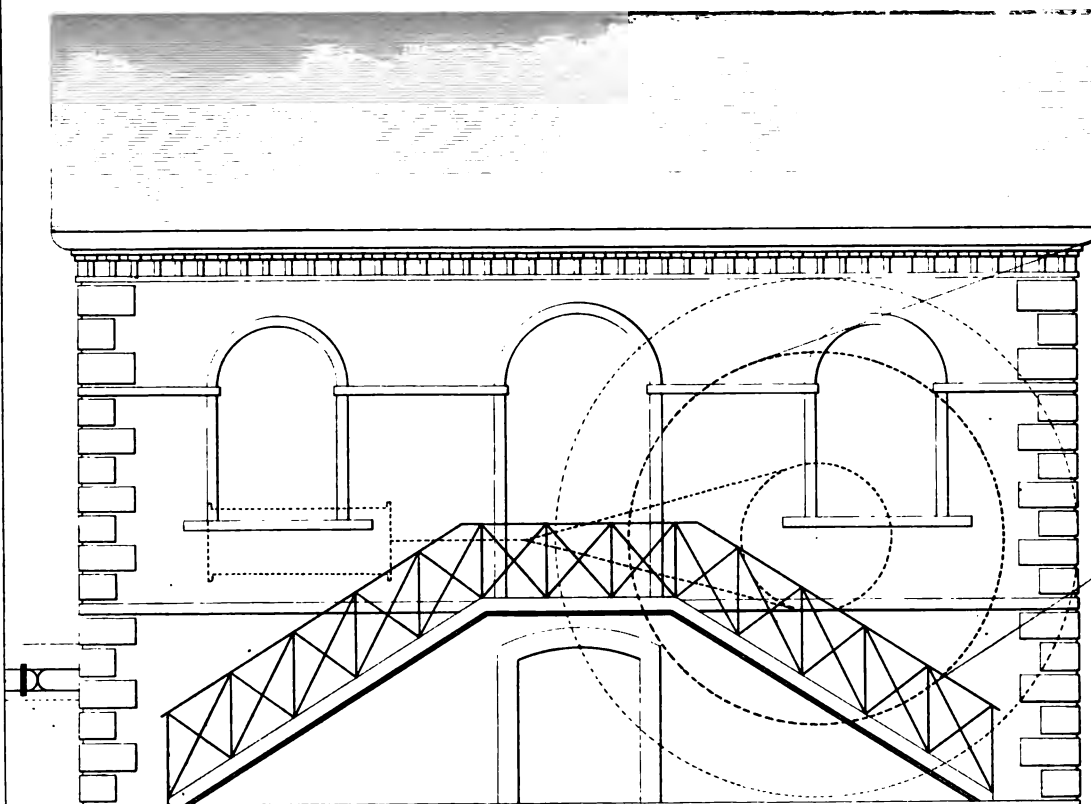


Fig. 1. Élévation.
Echelle $\frac{1}{100}$.



ETIENNE. PUIT'S SAINT LOUIS.

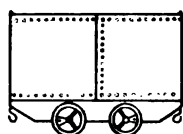


Fig. 6. Berline. Ech. 50.

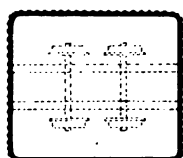


Fig. 3.
Coupe transversale de l'entablement.

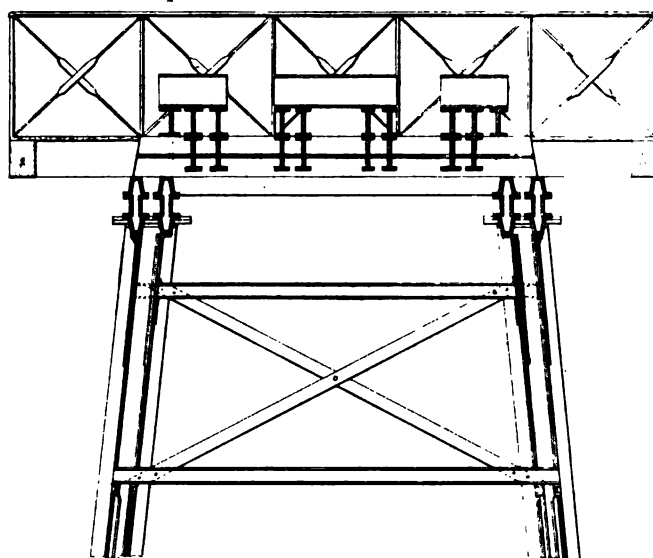
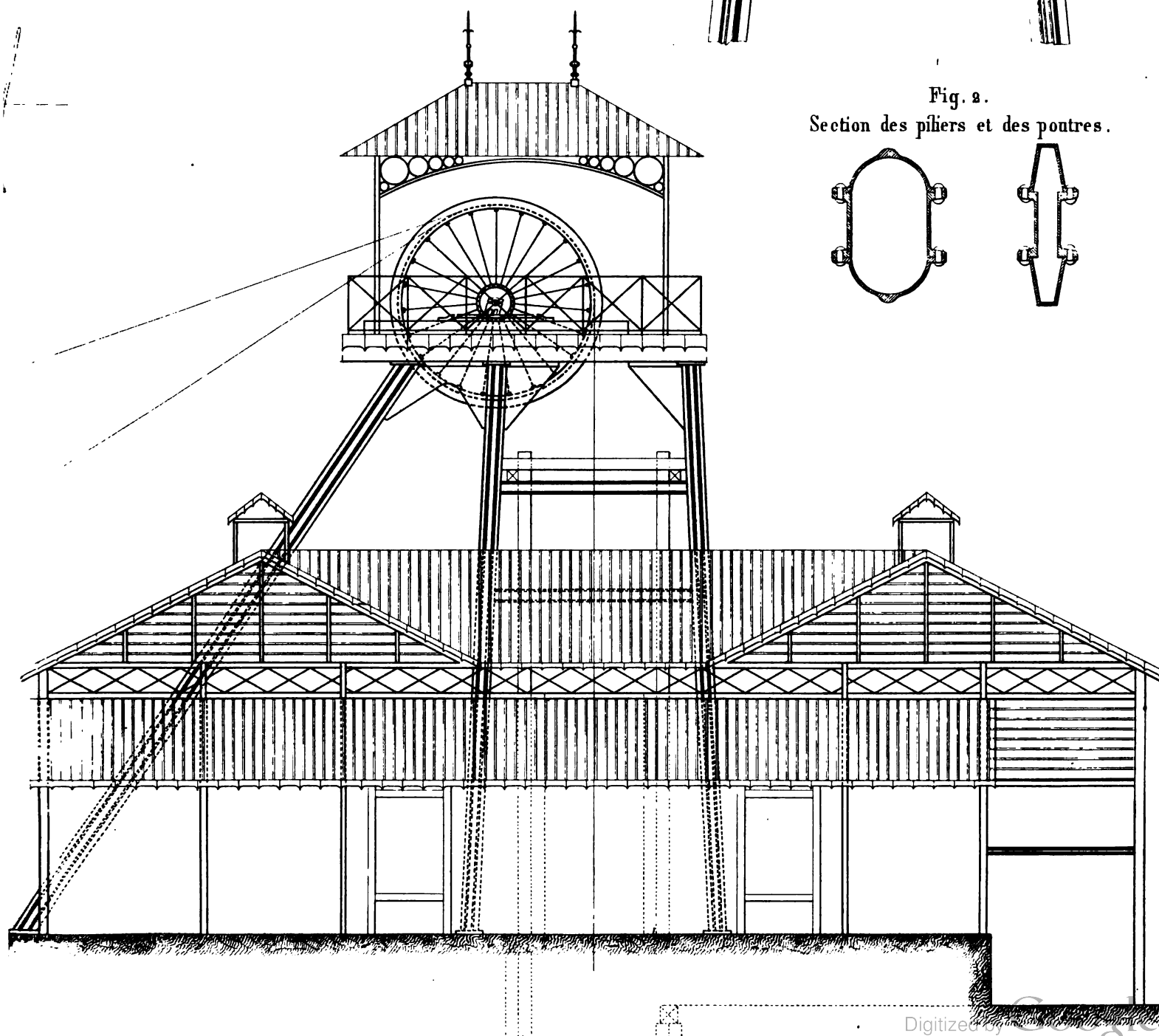
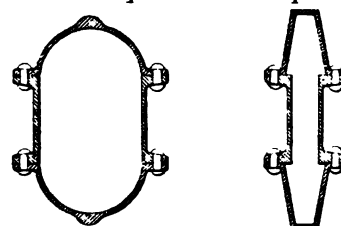
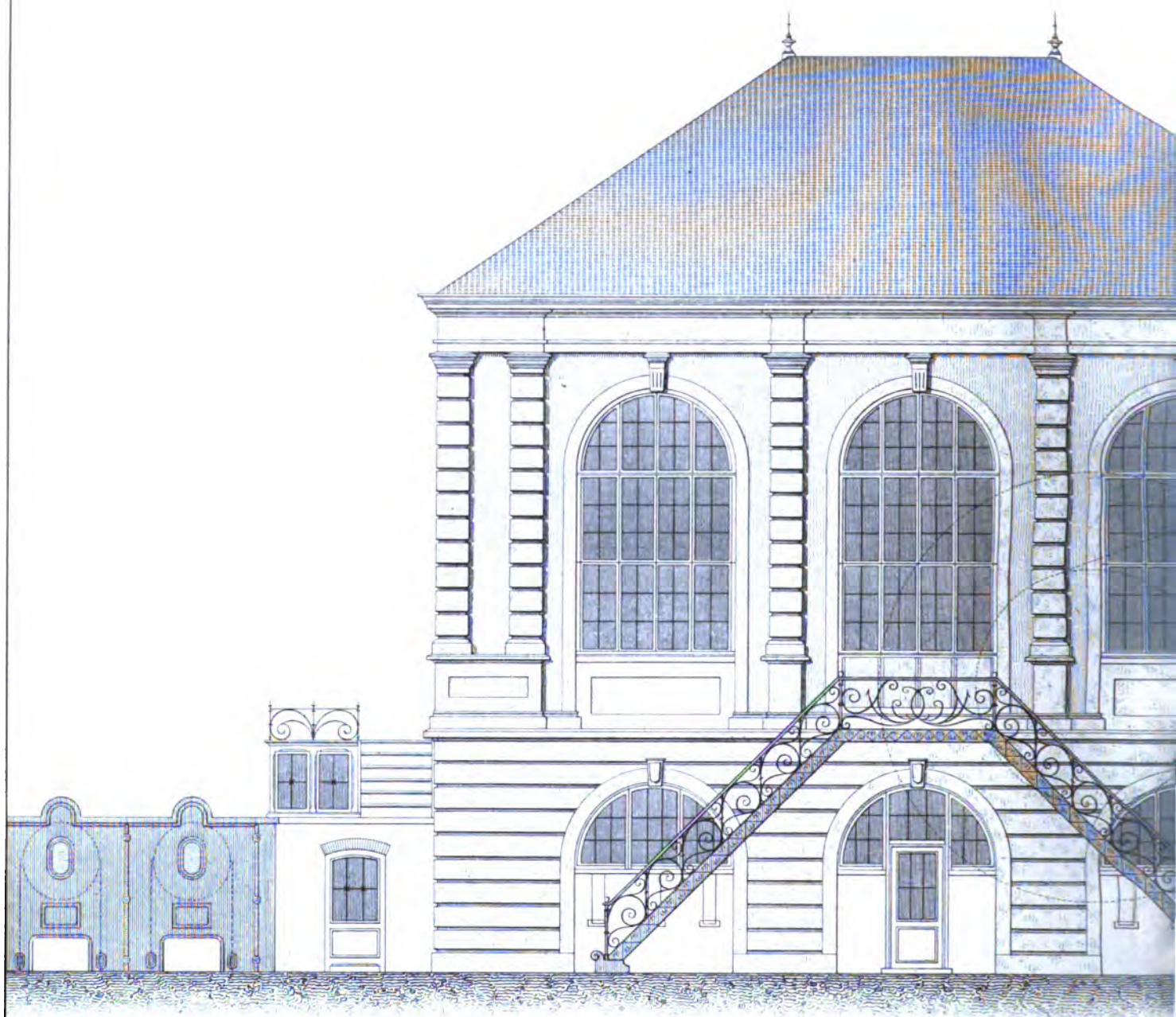
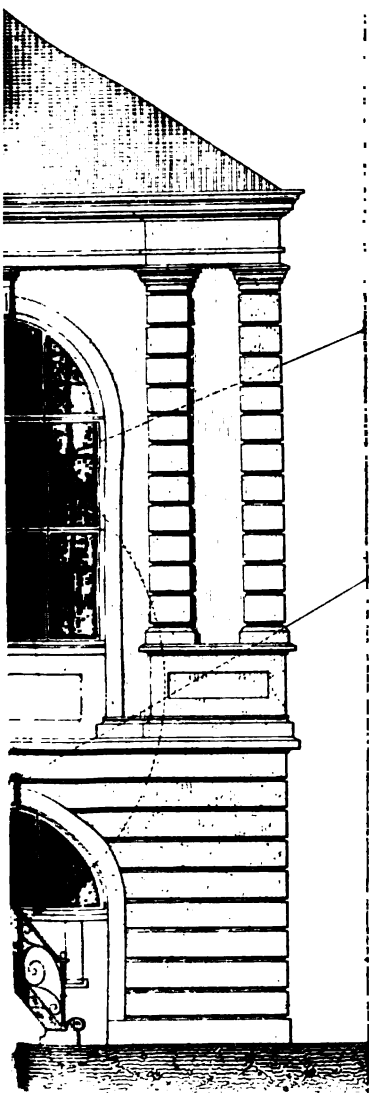


Fig. 2.
Section des piliers et des poutres.





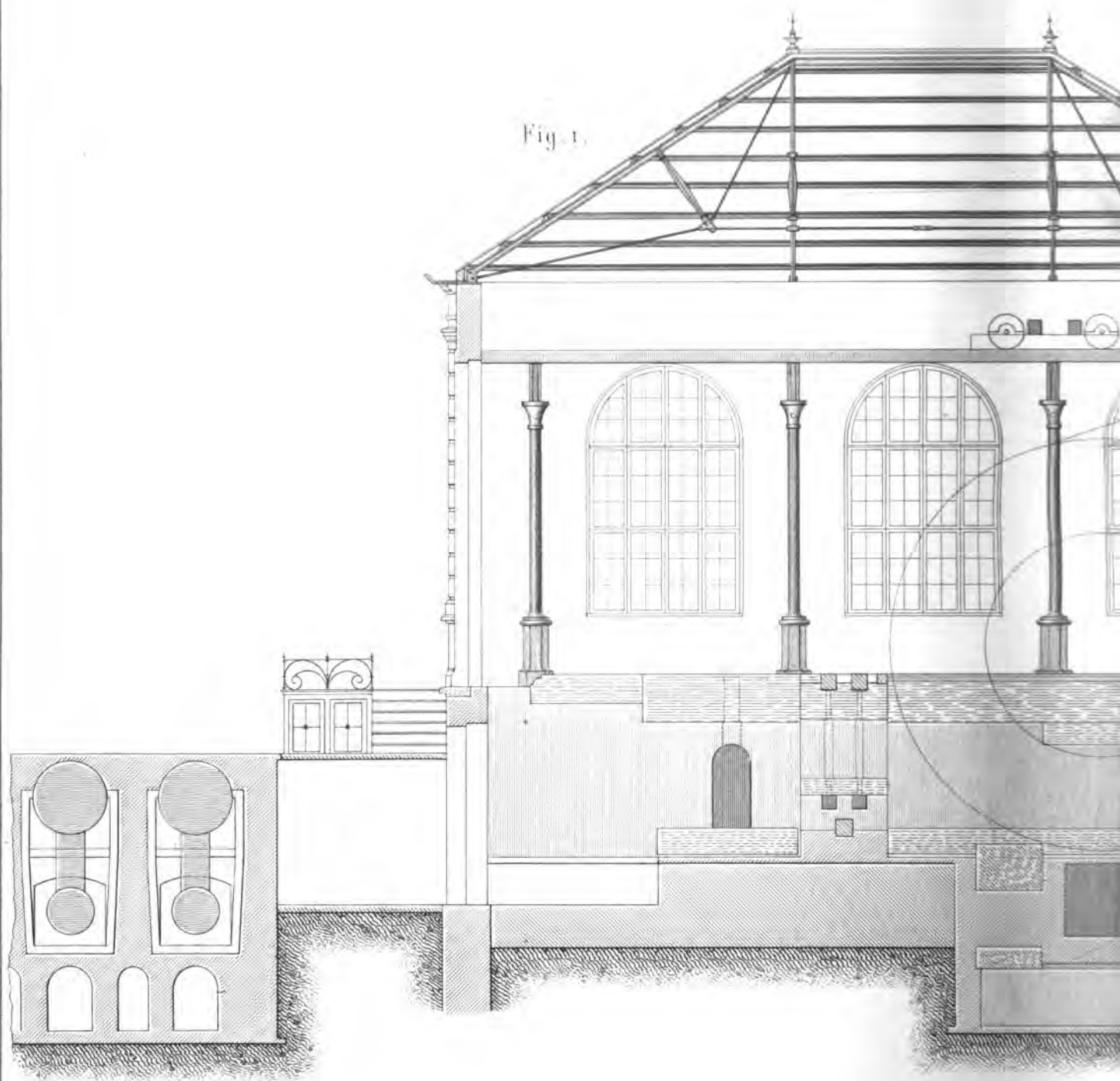
FOS



FOSSE DES VALLÉES, A GILLY-CHARLEROY.

Coupe longitudinale.

Echelle $\frac{1}{100}$



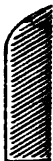
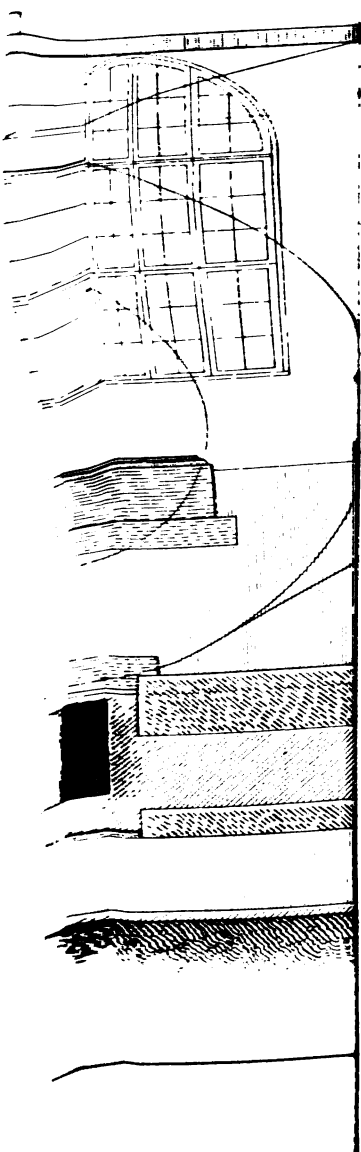
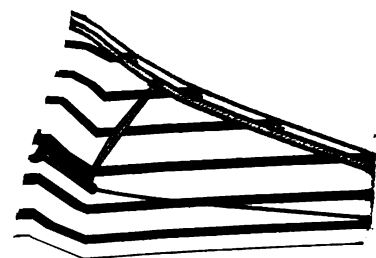


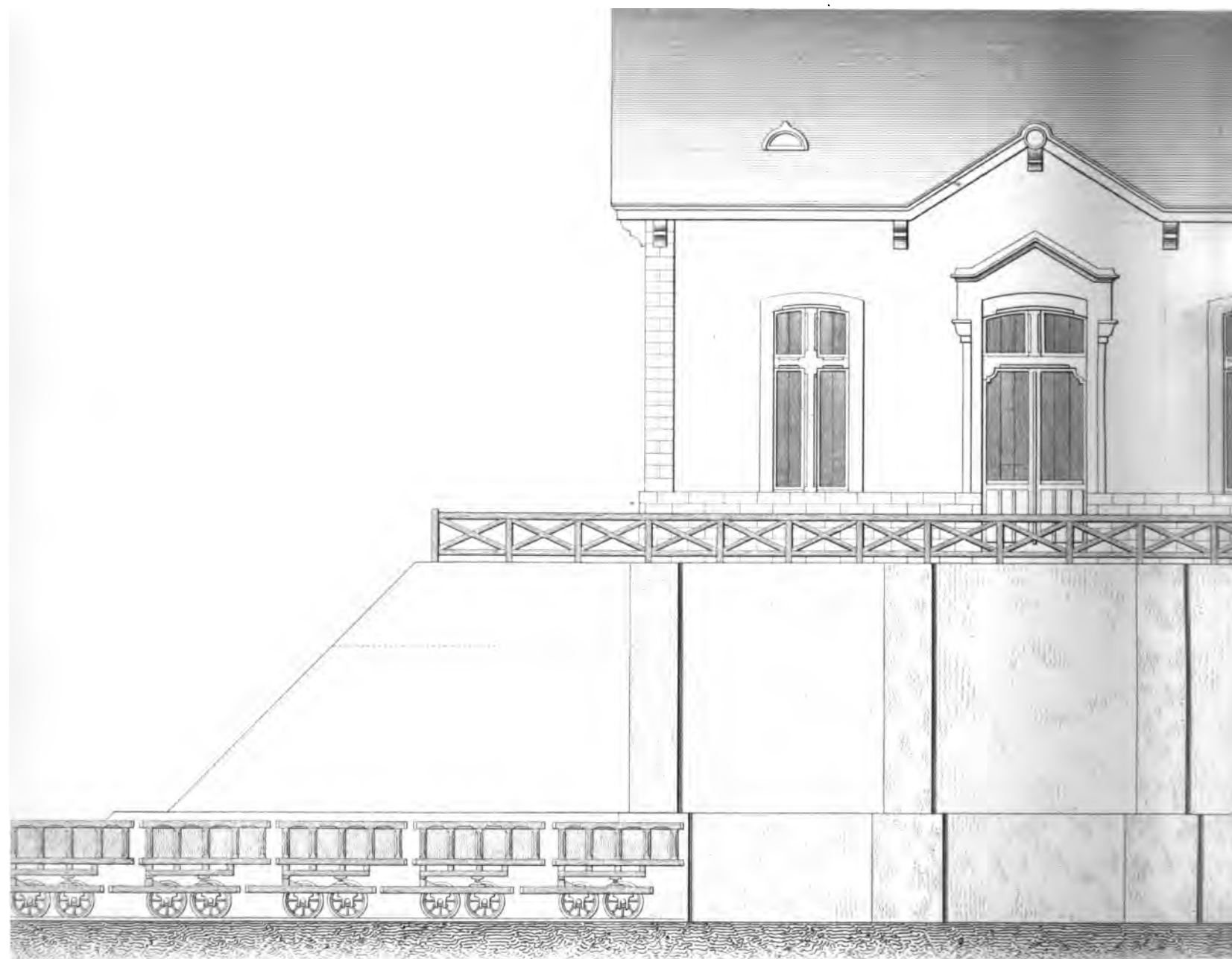
Fig. 2.

un de la fosse.

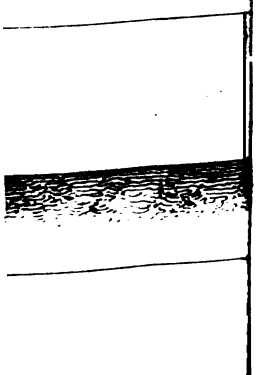
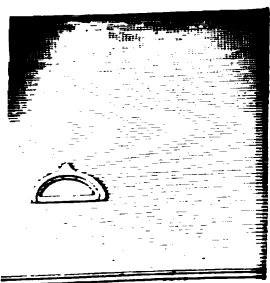


PUITS DU MACNY N° 2, A MONTU

Echelle $\frac{1}{100}$.

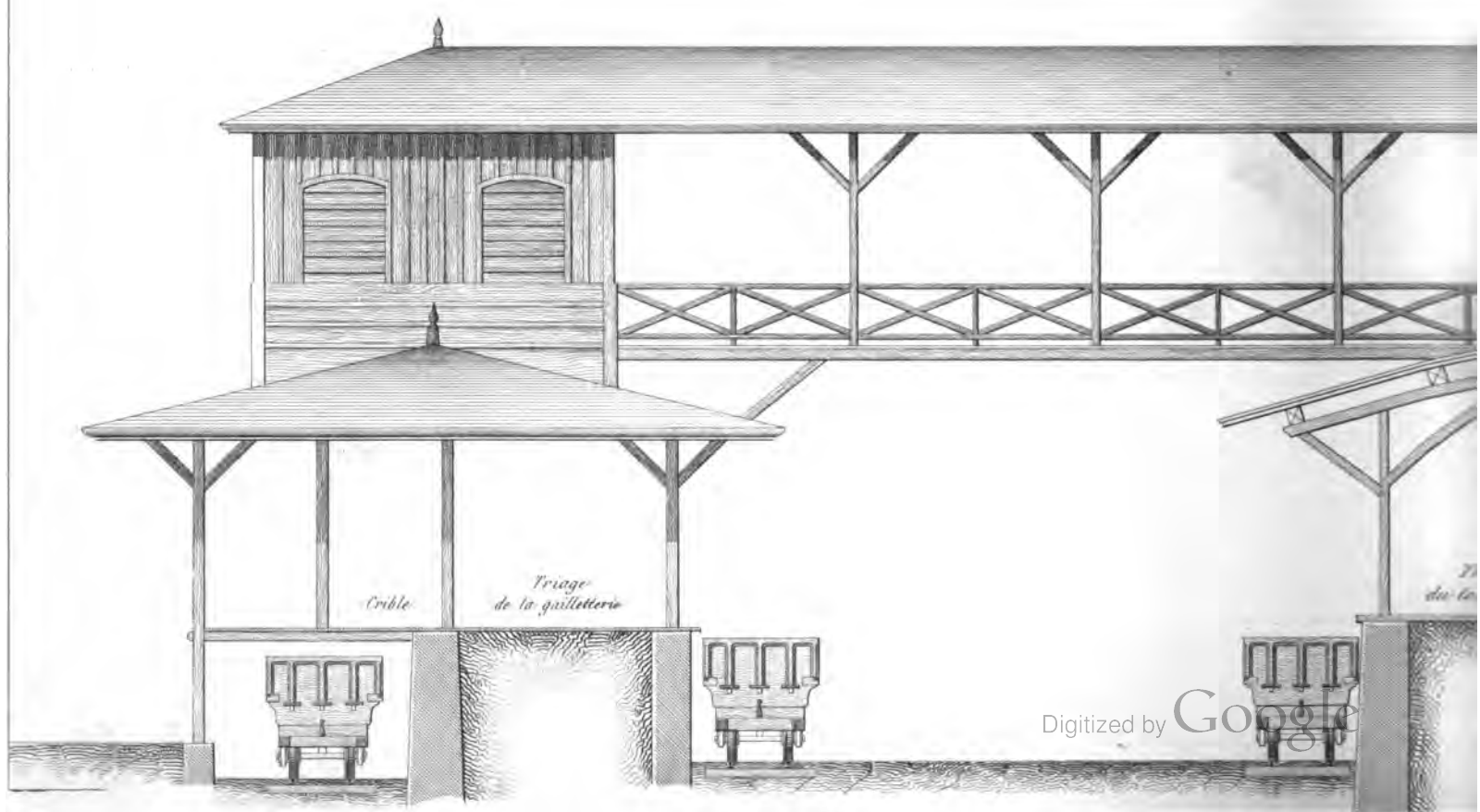


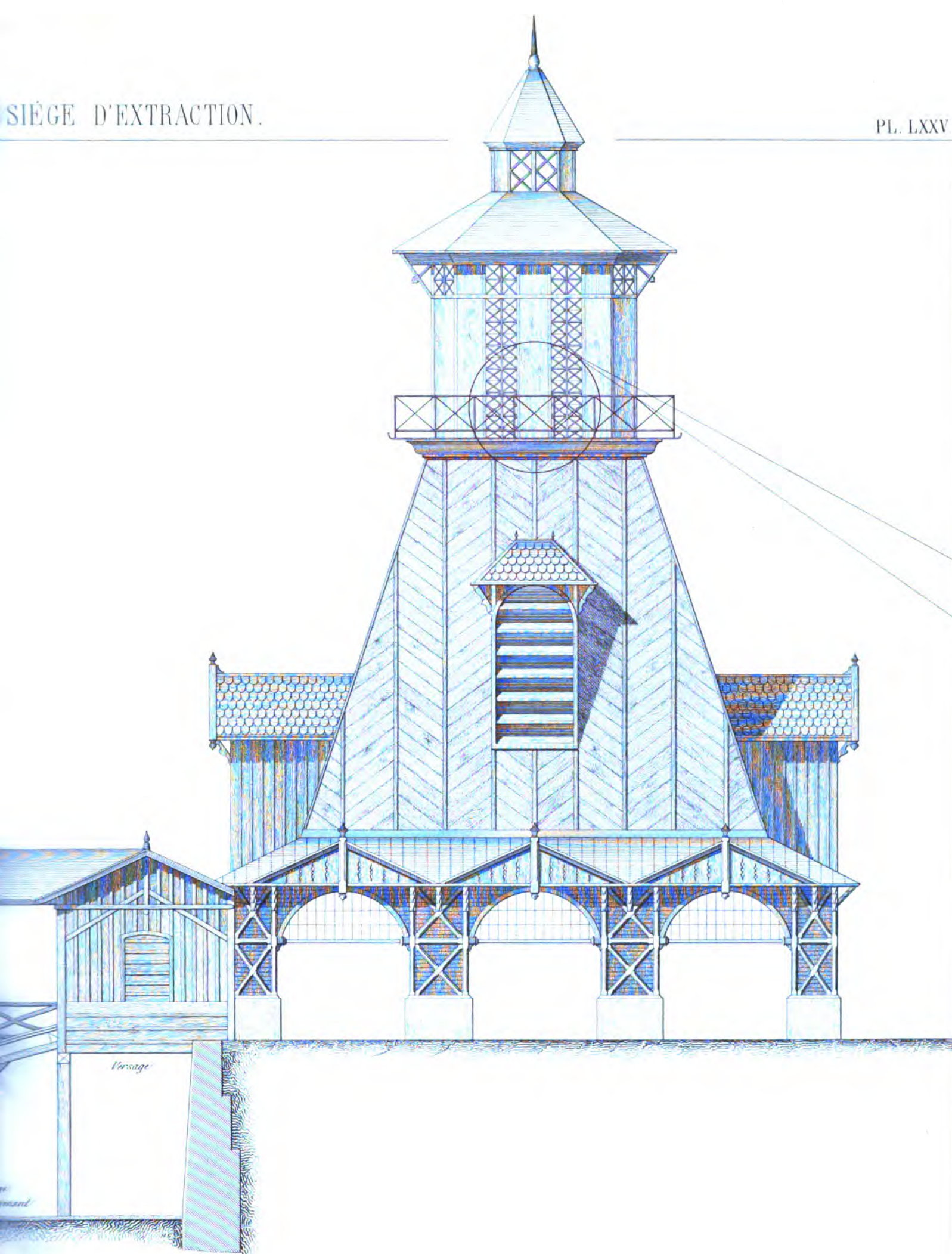
AU LES MINE



ÉLÉVATION LONGITUDINALE
DU PUIT'S LUCY N° 4.
à Montceau les mines.

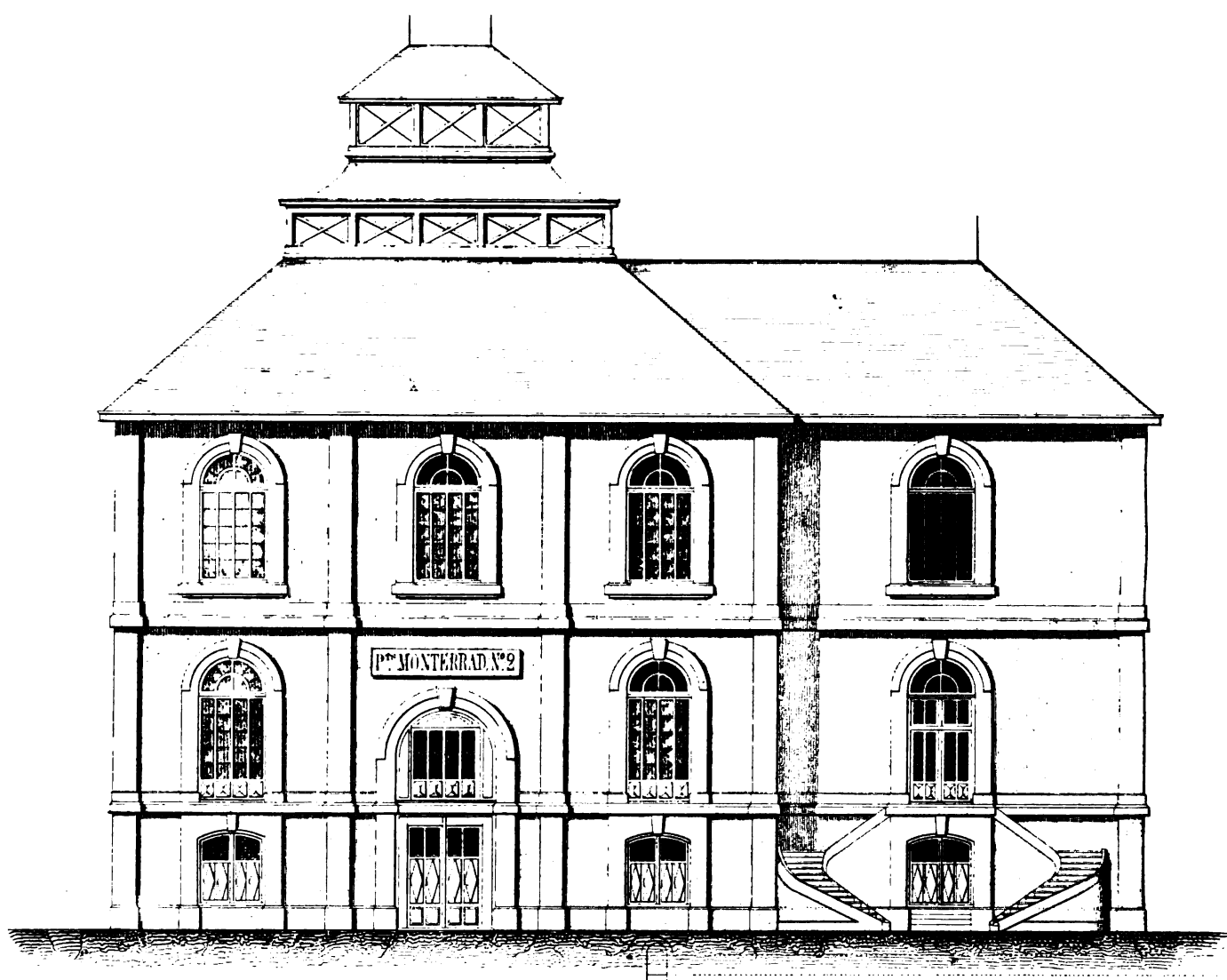
Echelle 0.01.





PUITS MONTEERRAD N°2

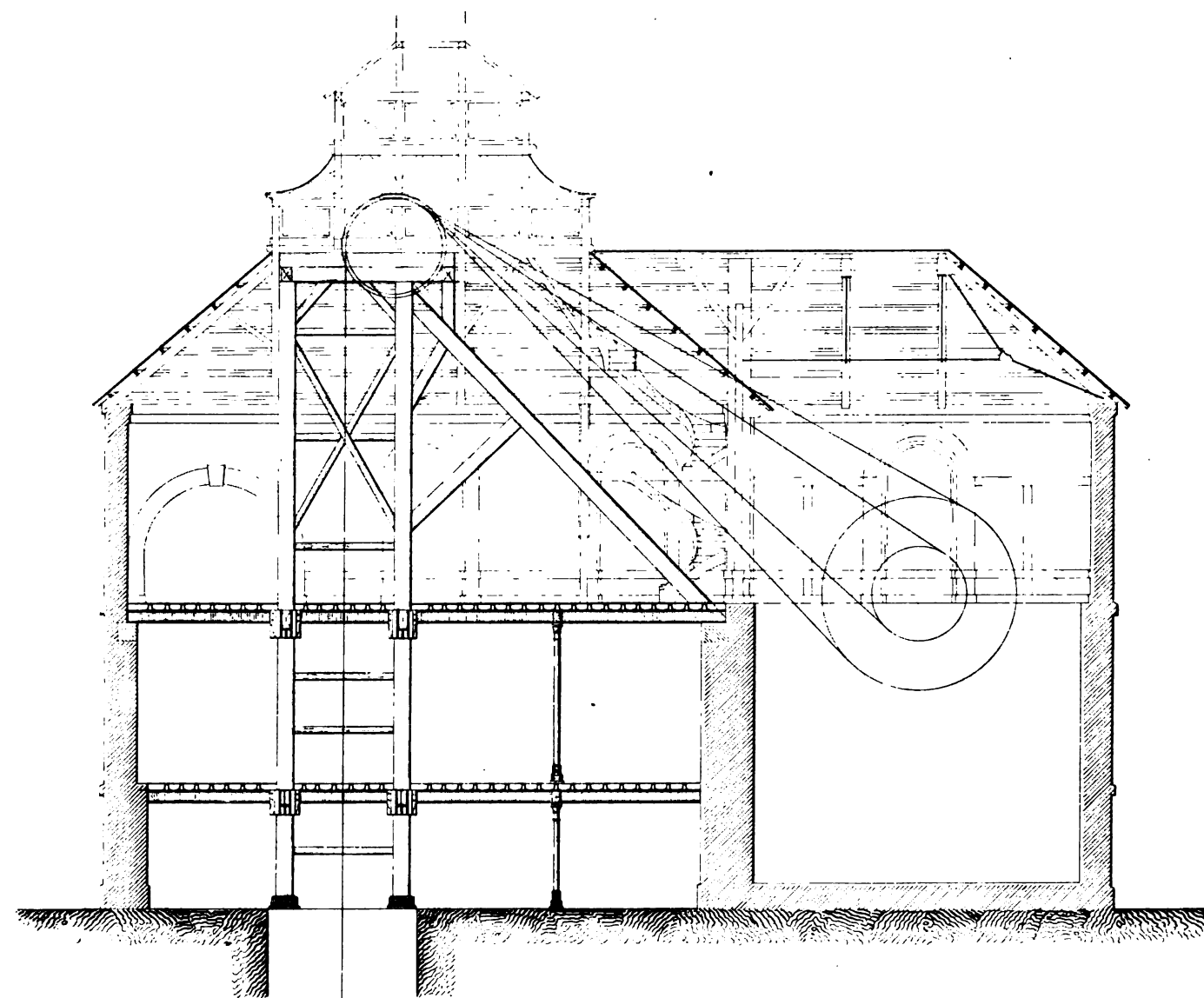
Échelle



Elevation.

A FIRMINY. LOIRE.

1
200.

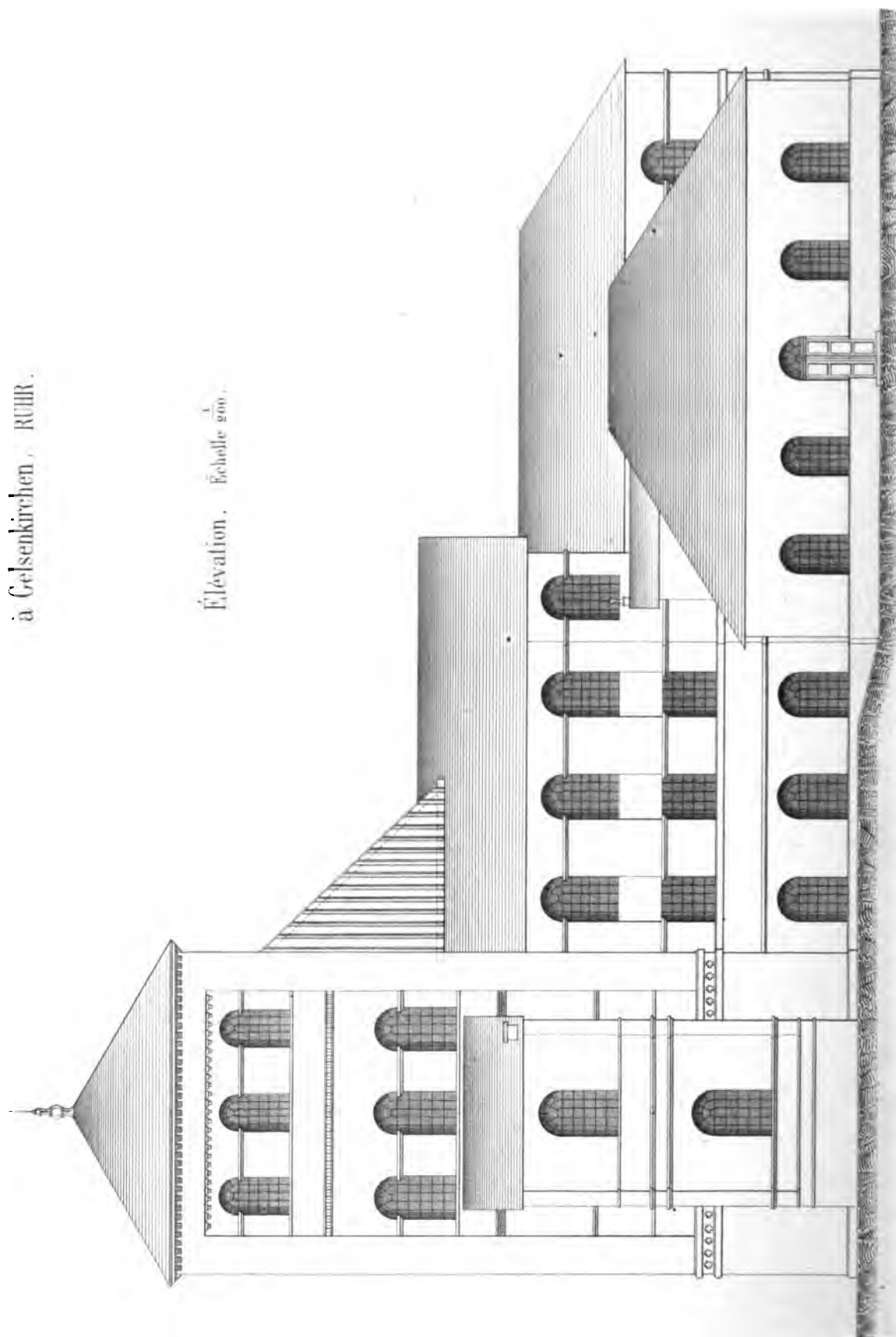


Coupe longitudinale.

CHARBONNAGE DE RHEIN ELBE.

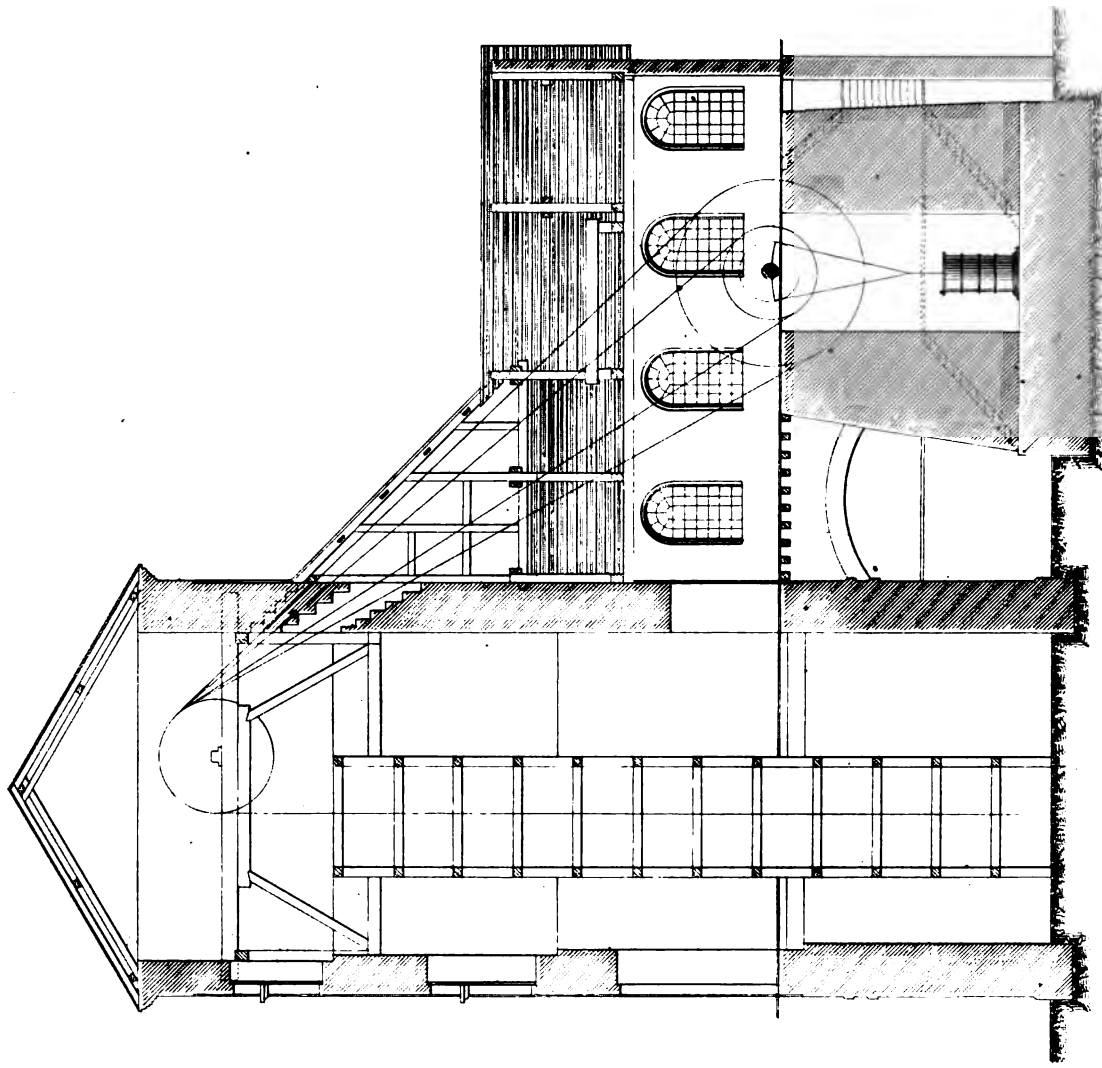
DETILLEUX ET C^{re}.

à Gelsenkirchen, RUHR.

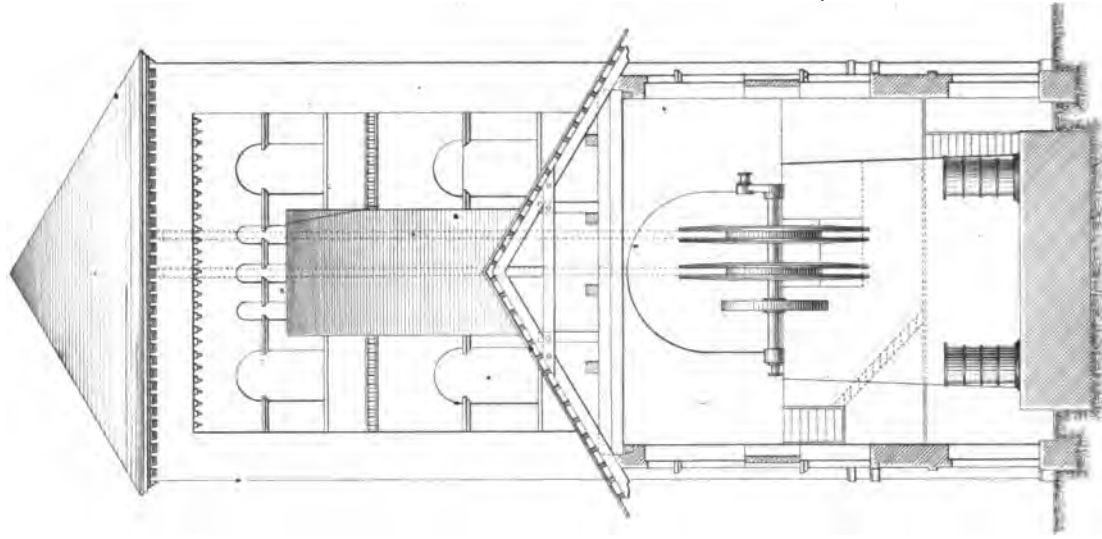


Élévation, Echelle 1/2000.

Coupe longitudinale.

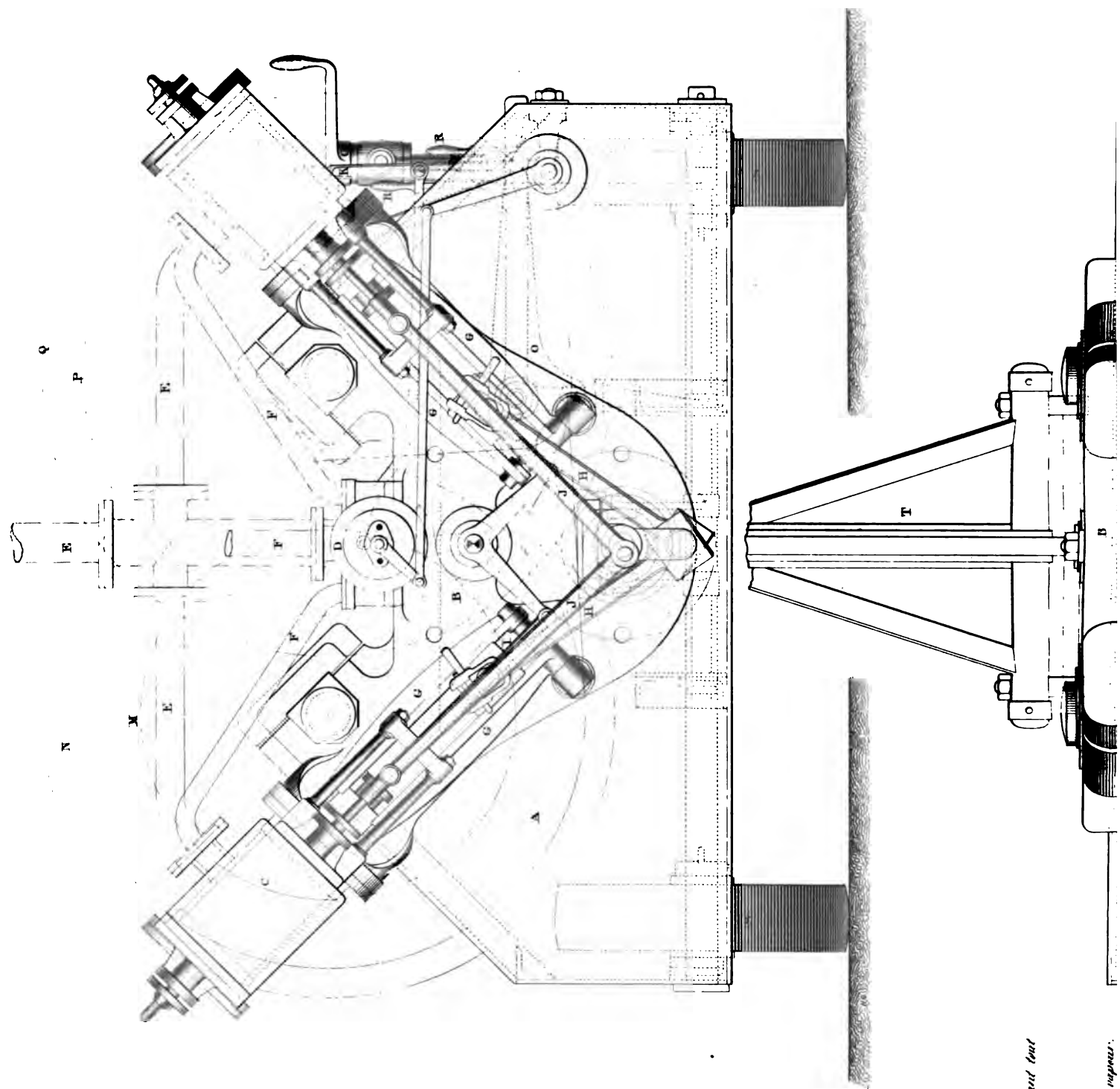


Coupe transversale.



Architecte imprimeur de l'Académie, à Liège.

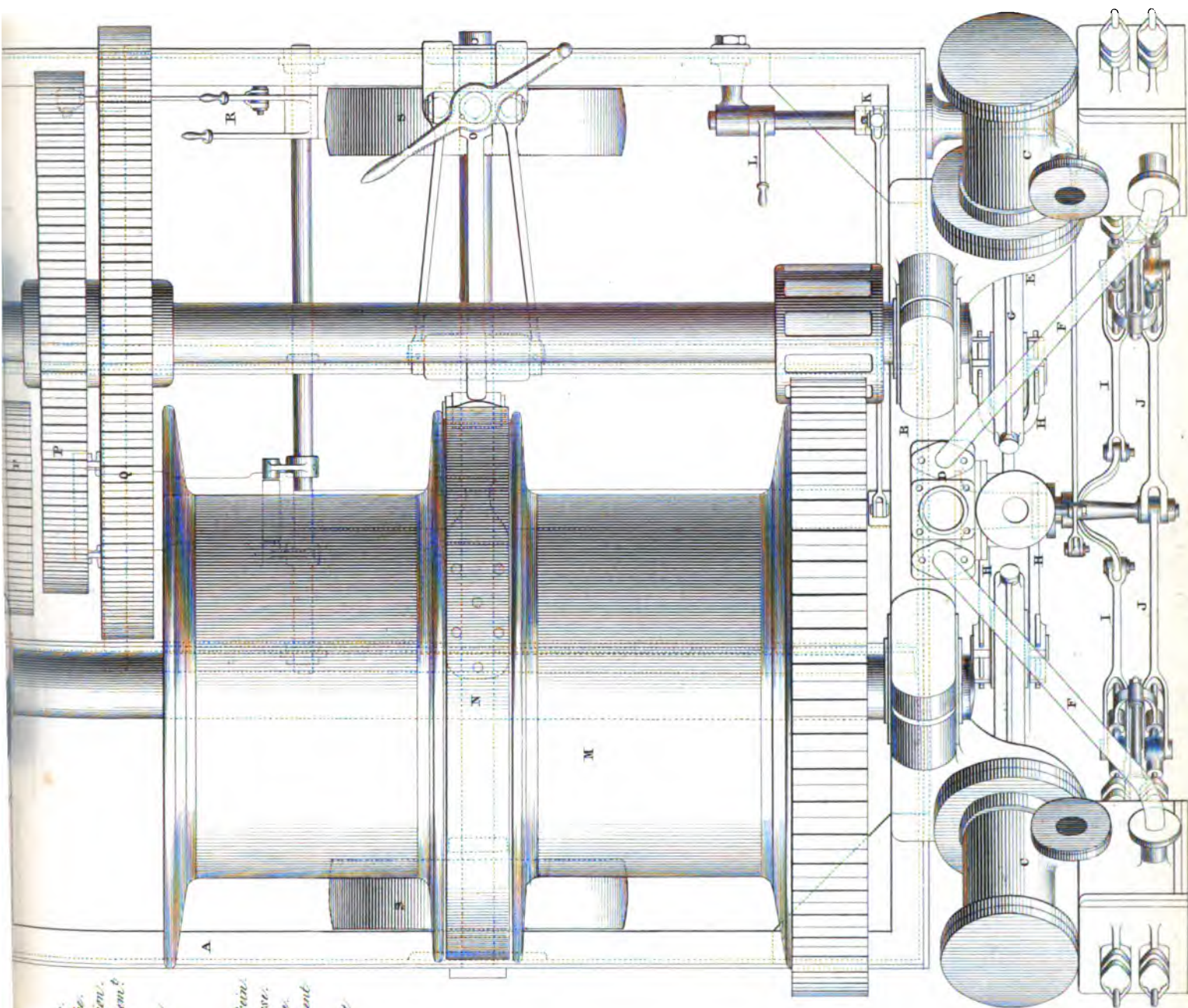
CABESTAN LOCOMOBILE DE REVOLIER ET BIETRIX.



Légende .

- A Châssis en tôle recevant tout le mouvement .
- B Roue
- C Cylindres à vapeur.
- D Capillon de prise de vapeur.

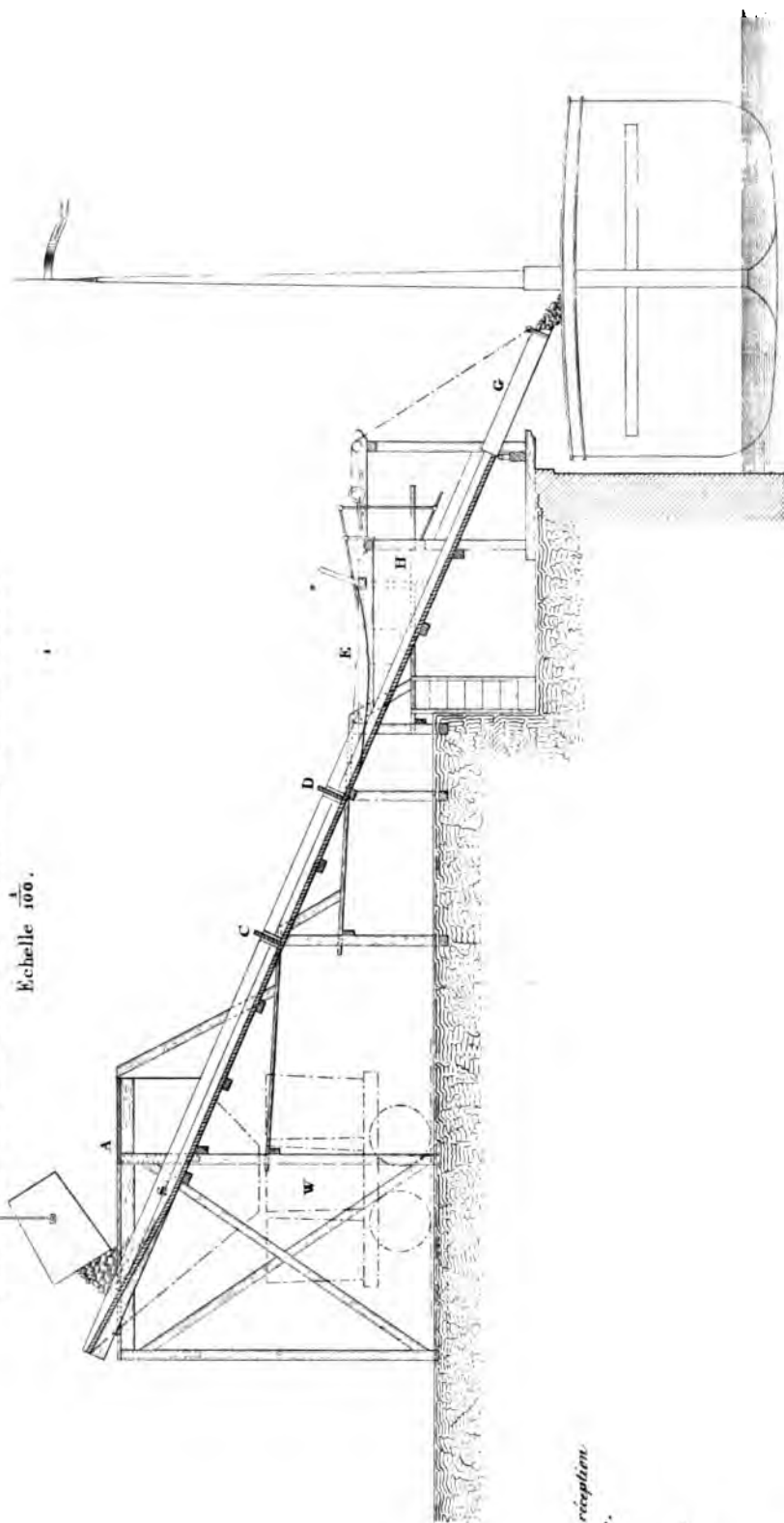
- A Châssis.
 B Bielles motrices.
 C d' pour les tables motrices.
 D pour le changement de marche.
 E Bielles des tiroirs de distribution.
 F Levier de manœuvres de changement de marche.
 G Levier de manœuvre de prise de vapeur.
 H Tambour d'entraînement.
 I Poulie de frein.
 J Levier de serrage du frein et freins.
 K Engrenage pour la grande vitesse.
 L d' pour la petite vitesse.
 M Leviers de débrayage (changement de vitesse).
 N Roues en acier pour le transport du cahotier.
 O Tonneau en bois ferré.



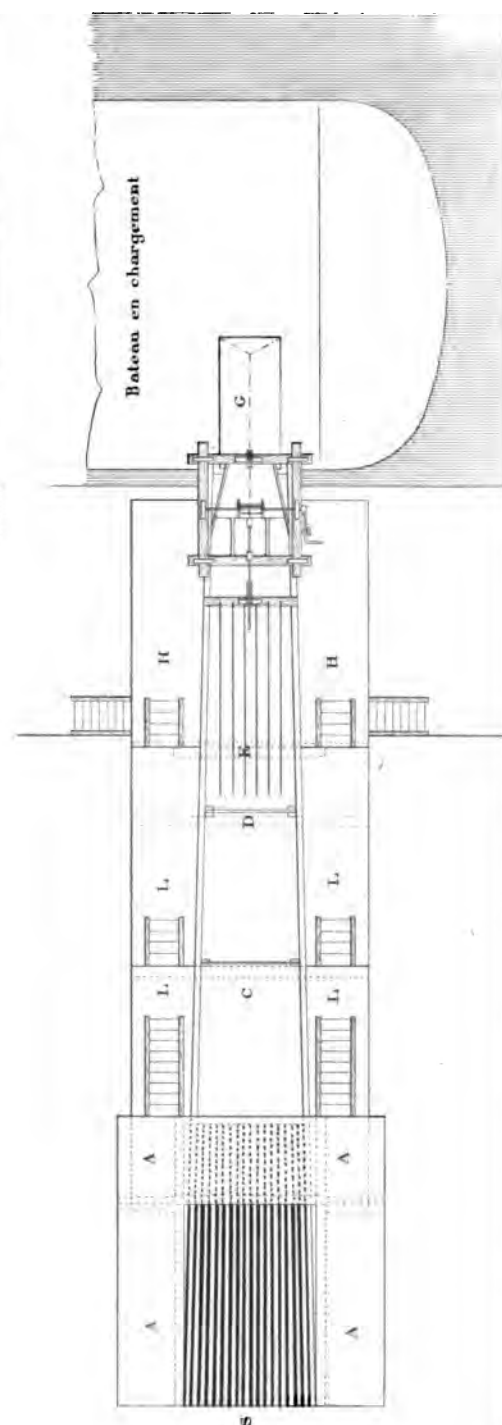
GLISSIÈRE COURTIN

POUR LE CHARGEMENT DIRECT DES CHARBONS, A DENAIN.

Echelle 1/100.



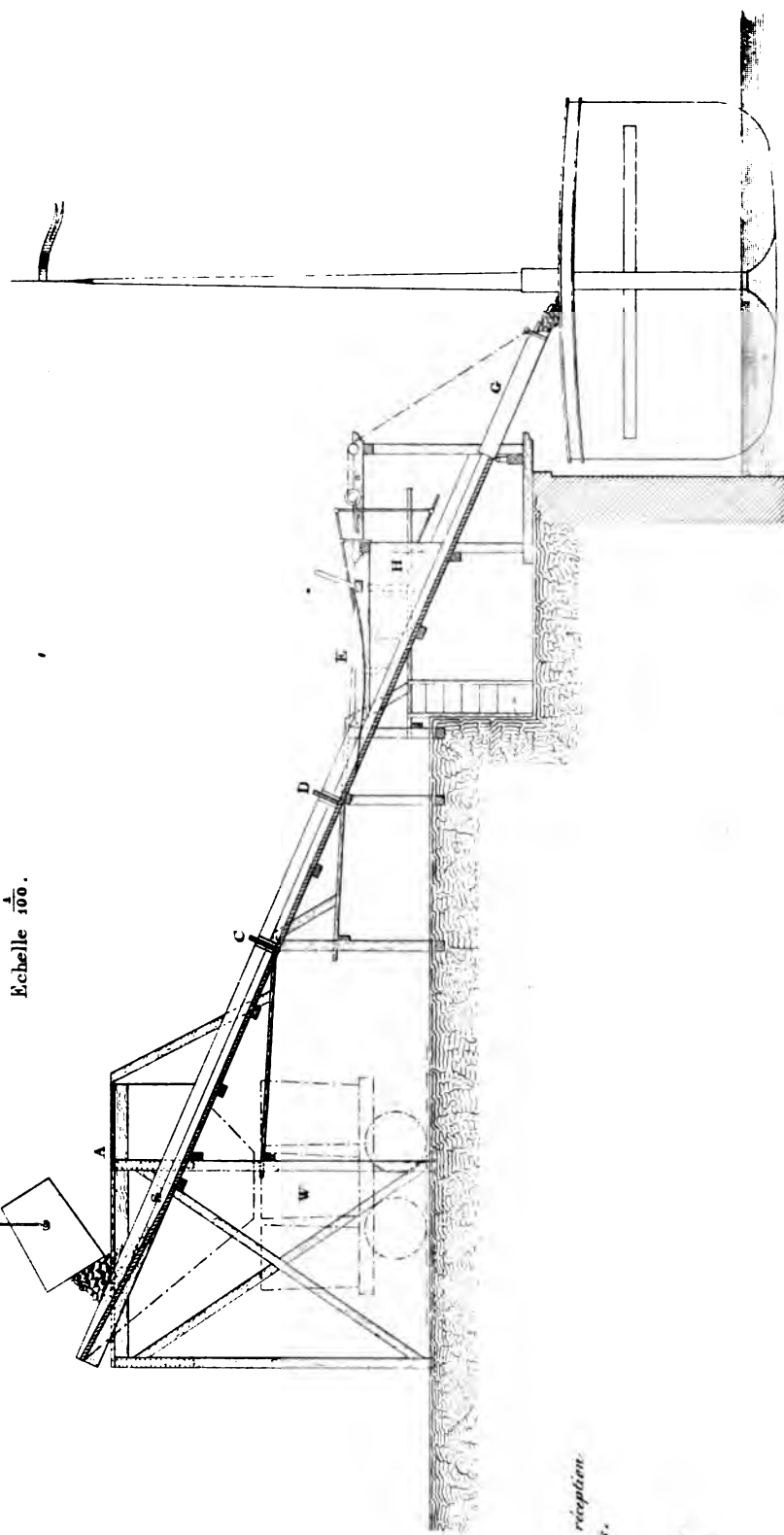
- A Plancher supérieur pour la réception et le serrage de caisses.
- CD Planchettes de retour.
- E Grille.
- H Grille pour recevoir le gros.
- F Plancher pour le déposer.
- G Trémie mobile.
- L Plancher de triage.
- W Wagons recevant les fines.



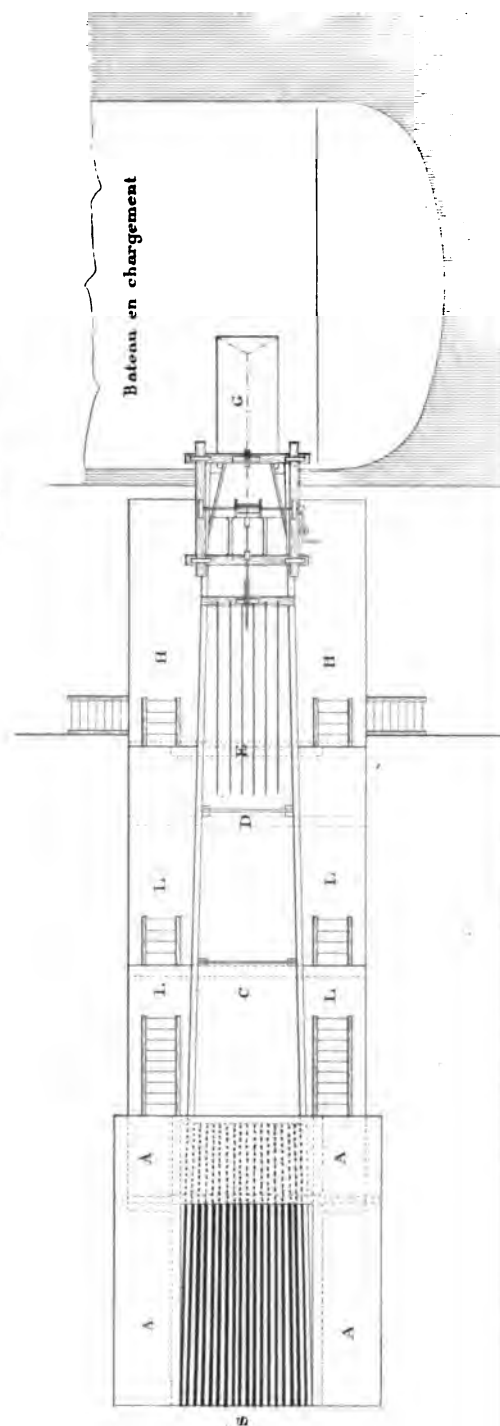
GLISSIÈRE COURTIN

POUR LE CHARGEMENT DIRECT DES CHARBONS, A DENAIN.

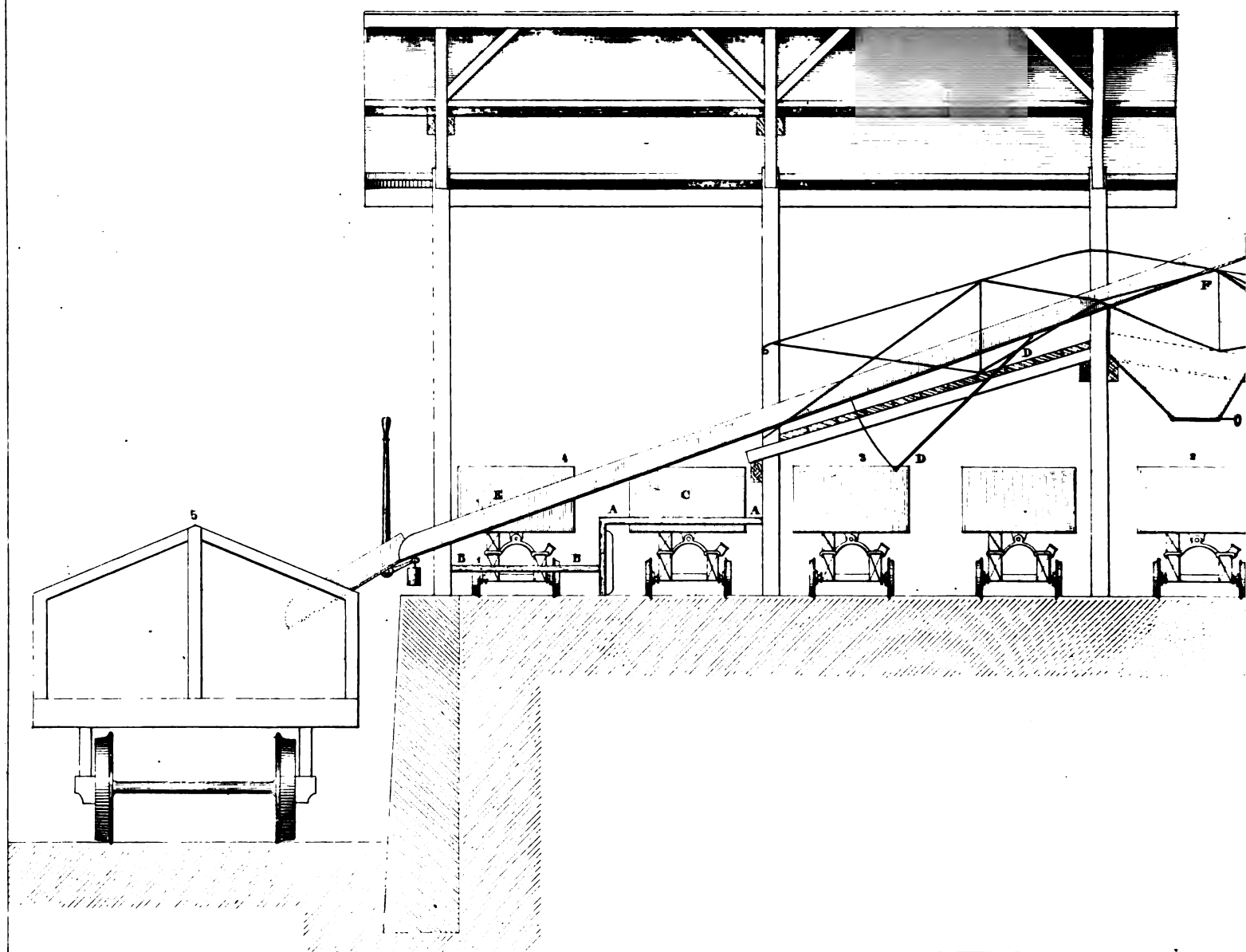
Echelle 1/100.

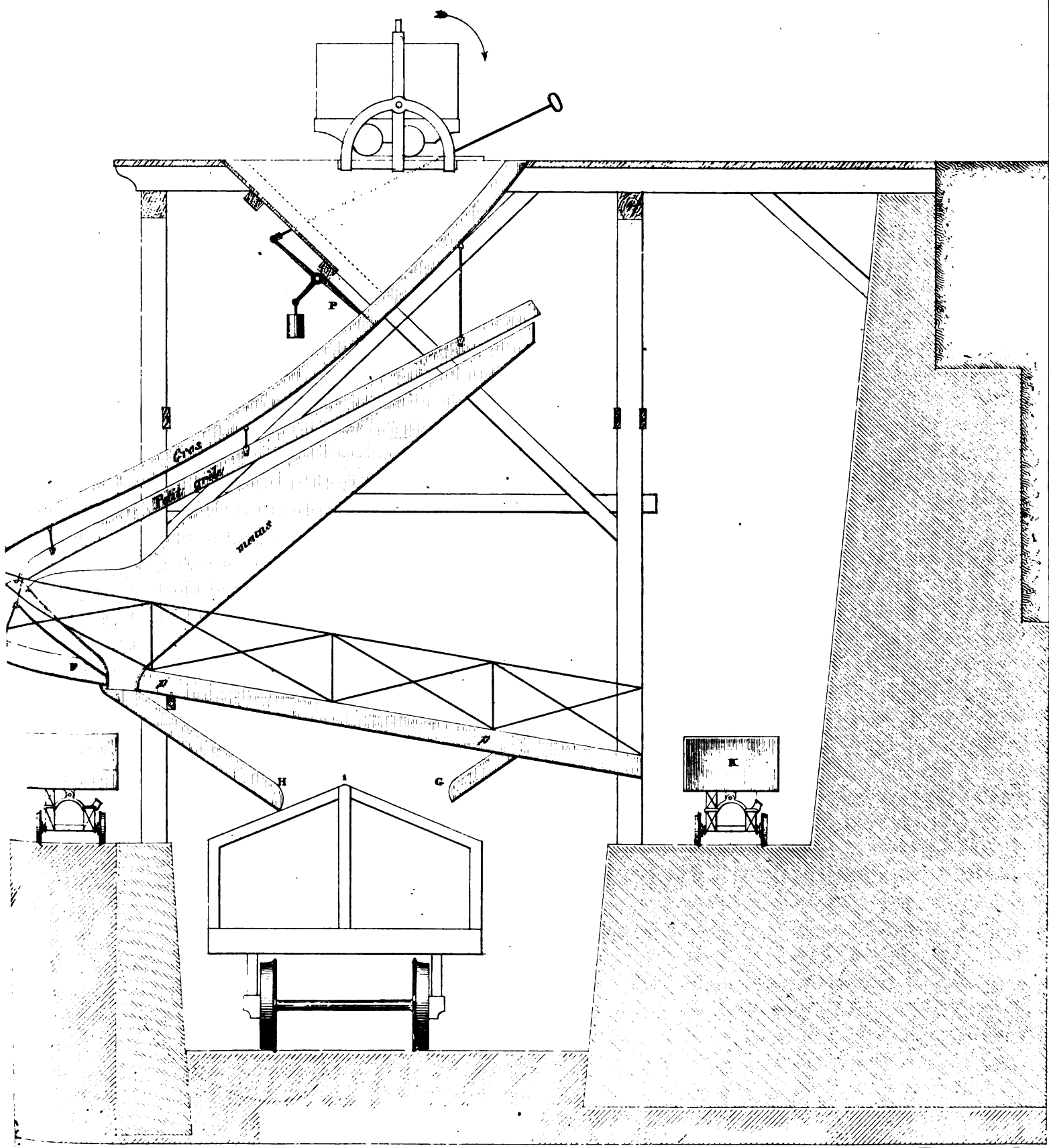


- A Plancher supérieur pour la réception et le versage de caisses.
- C'D Planchettes de retenue.
- S Crible.
- E Grille pour retenir le gros.
- H Plancher pour le déposer.
- F L'auca.
- G Trémie mobile.
- L Planchers de triage.
- W Wagon recevant les fines.



CRIBLE DE DECAZENILLE. (AVEYRON.)

Echelle $\frac{1}{50}$.

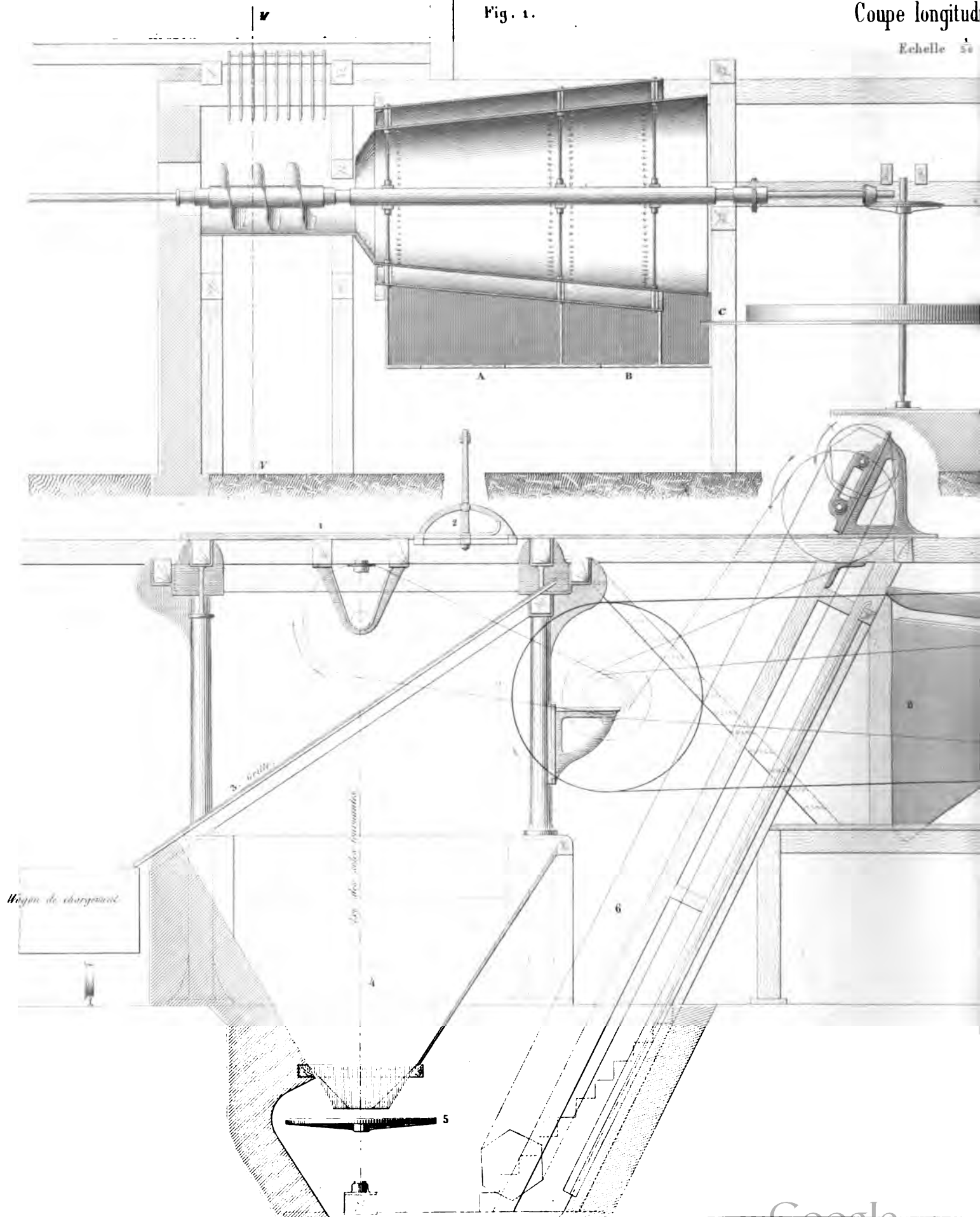


CRIBLAGE ET TRIAGE DES CHARGES

Coupe longitudinale

Echelle 1/50

Fig. 1.



IONS DANS LA RUHR.
ale.

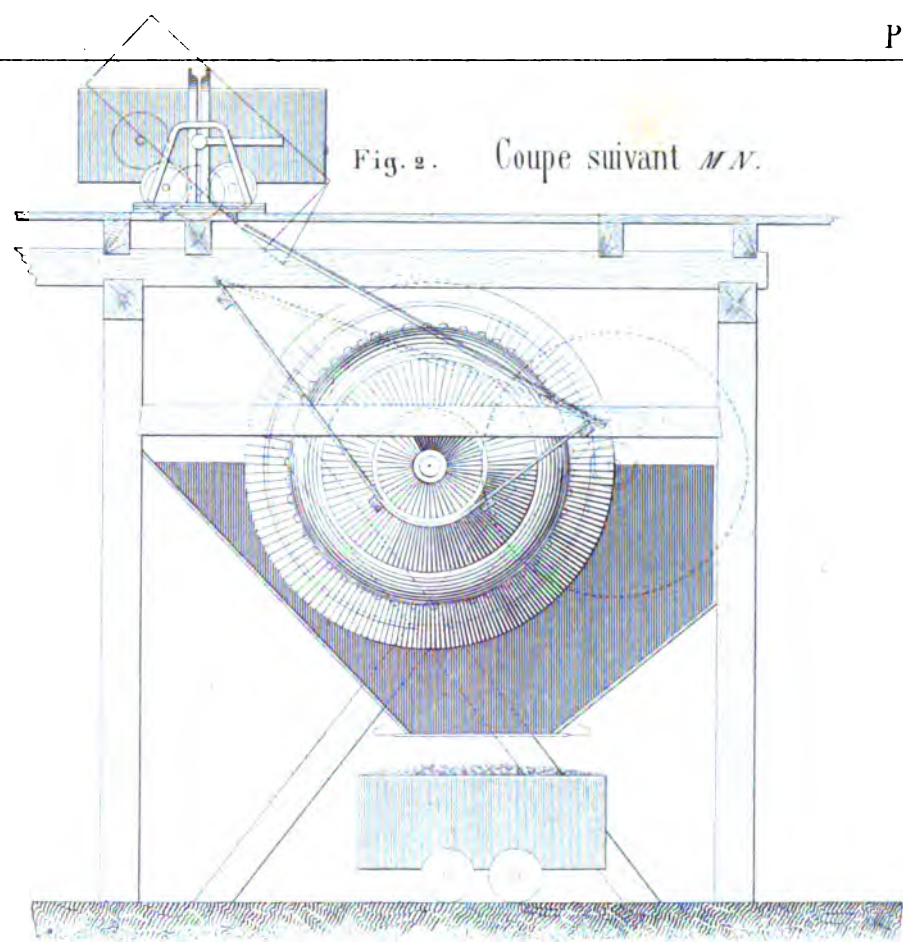
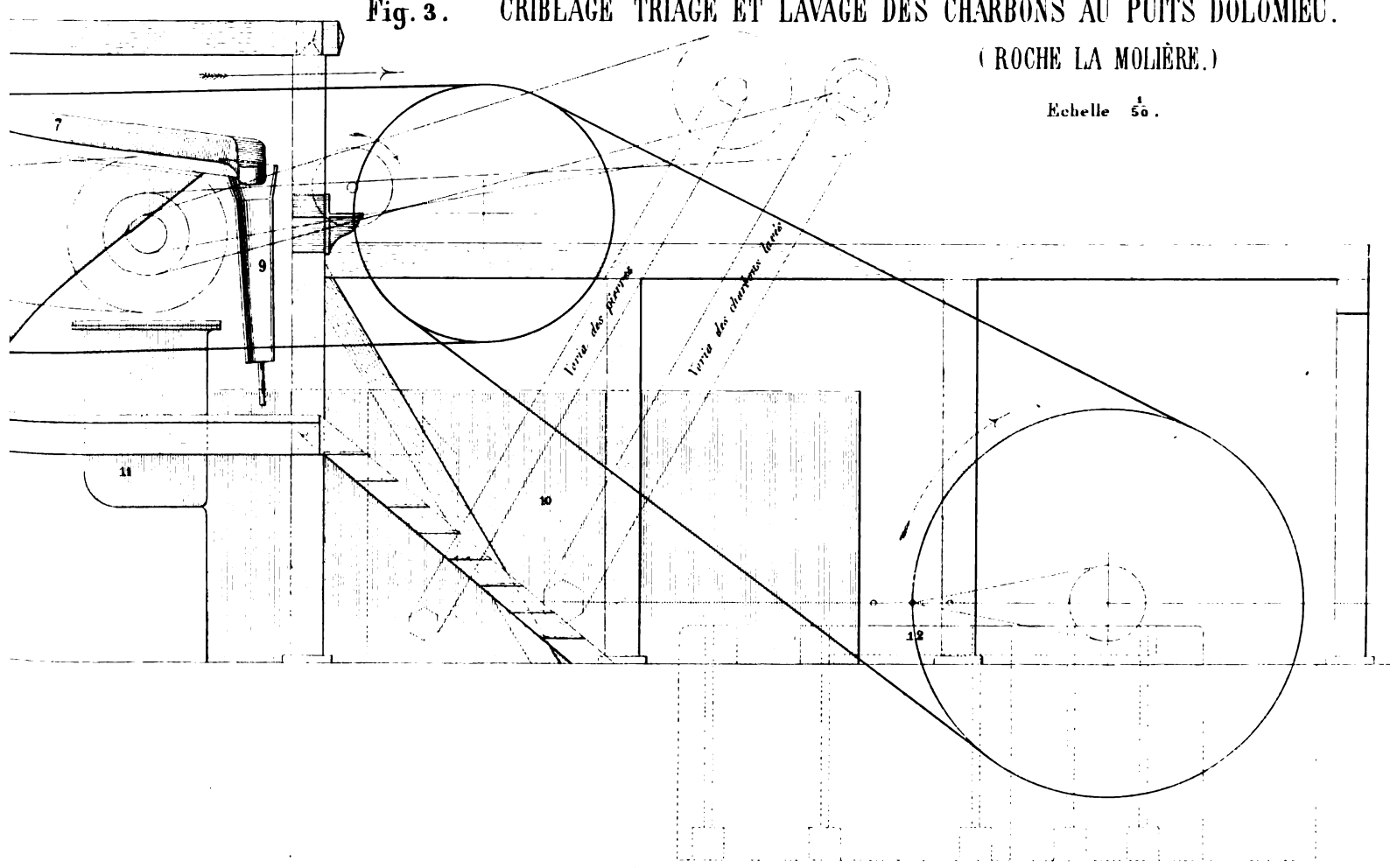
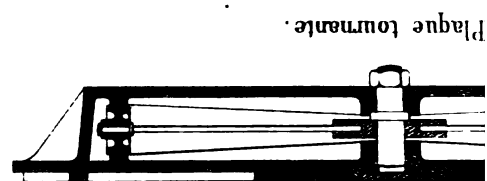
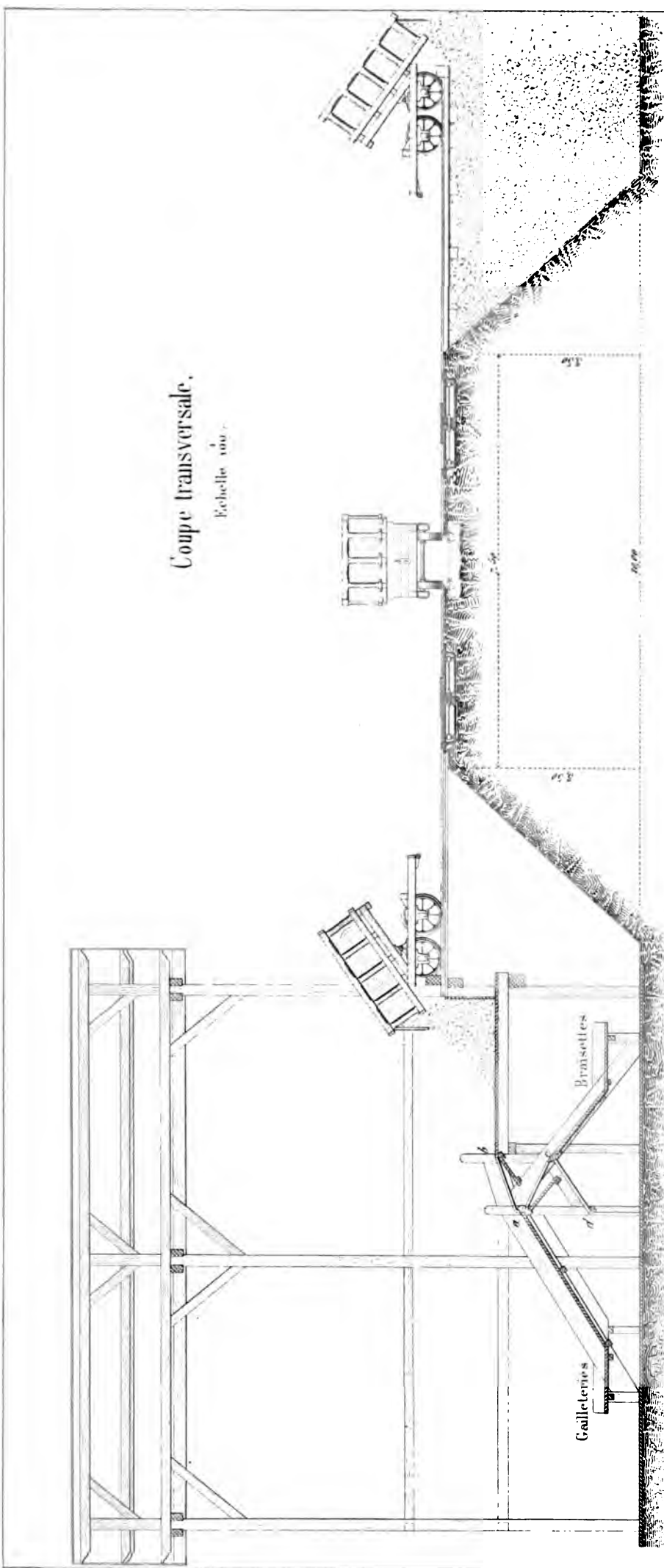


Fig. 3. CRIBLAGE TRIAGE ET LAVAGE DES CHARBONS AU PUIT DOLOMIEU.
(ROCHE LA MOLIERE.)

Echelle $\frac{1}{50}$.

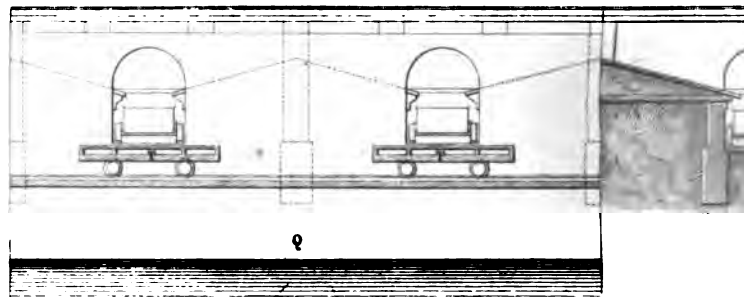
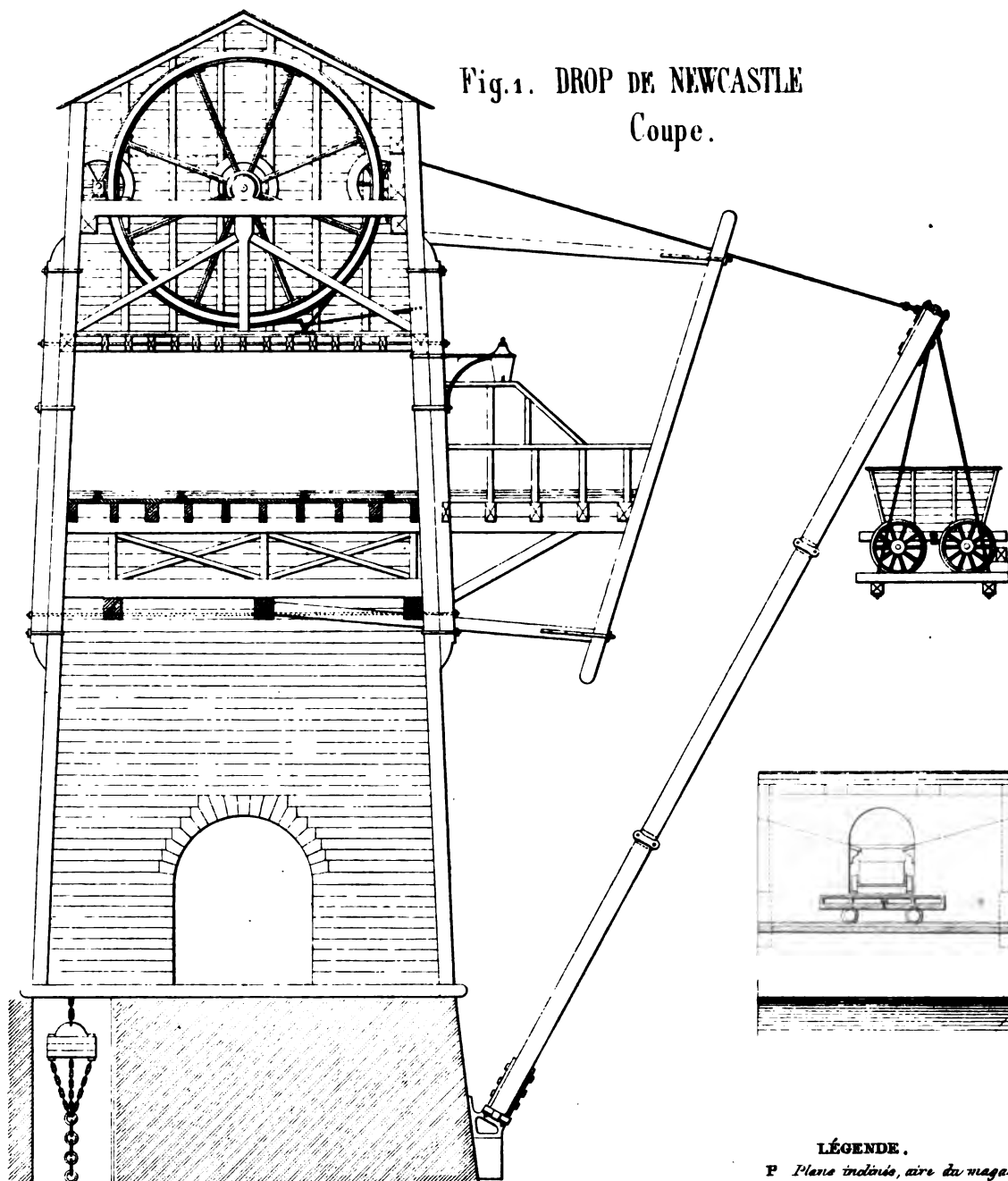


20



Plaque tournante.

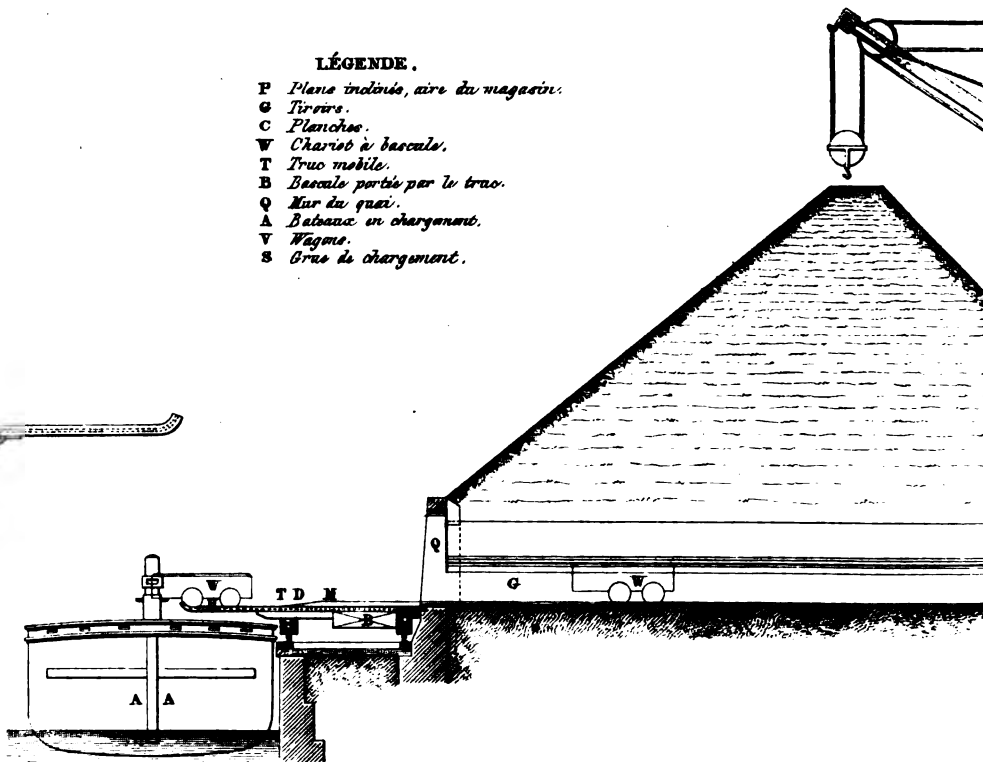
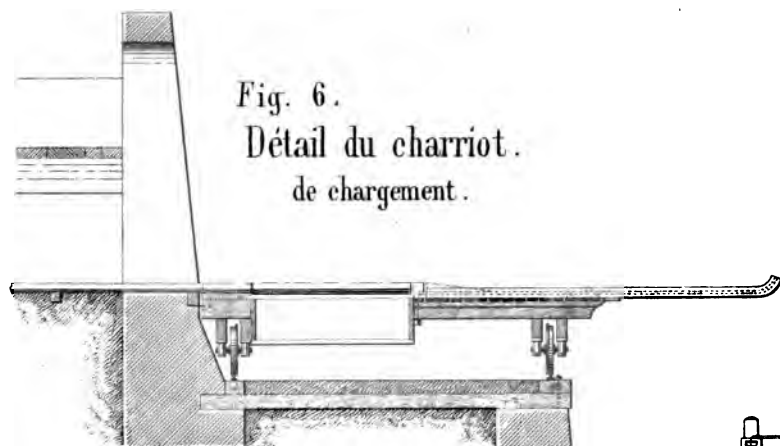
Fig.1. DROP DE NEWCASTLE
Coupe.



LÉGENDE.

- P Plane inclinée, aire du magasin.
- q Tirroir.
- C Planches.
- W Chariot à bascule.
- T Truc mobile.
- B Bascule portée par le trac.
- Q Mur du quai.
- A Bateaux en chargement.
- V Wagons.
- S Crue de chargement.

Fig. 6.
Détail du charriot.
de chargement.



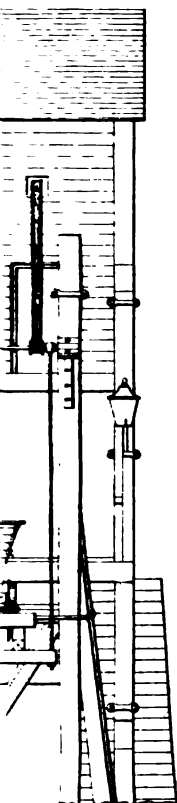
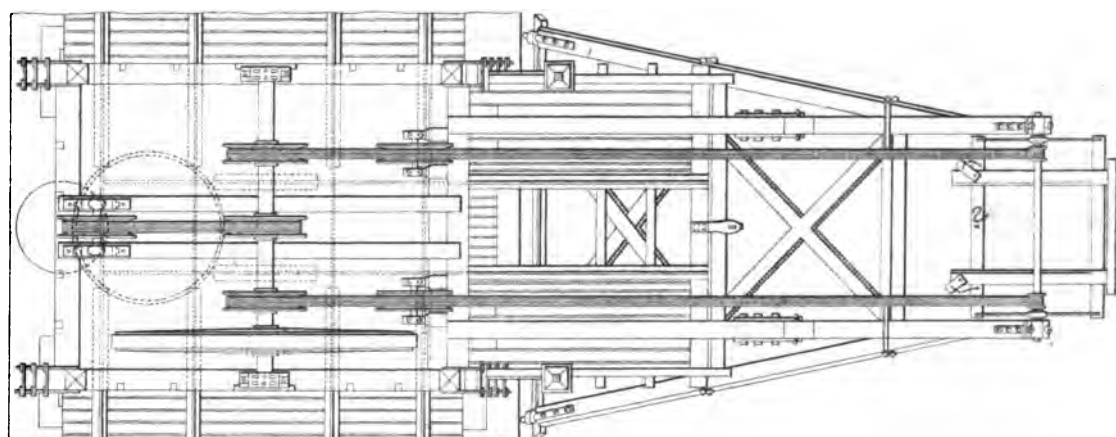


Fig. 2.
Élévation.

Fig. 3. DROP DE NEWCASTLE. Plan.



Échelle pour la fig. 3. 1 2 3 4 5 mètres

Fig. 4. Coupe longitudinale des quais à tiroirs. (Denain).

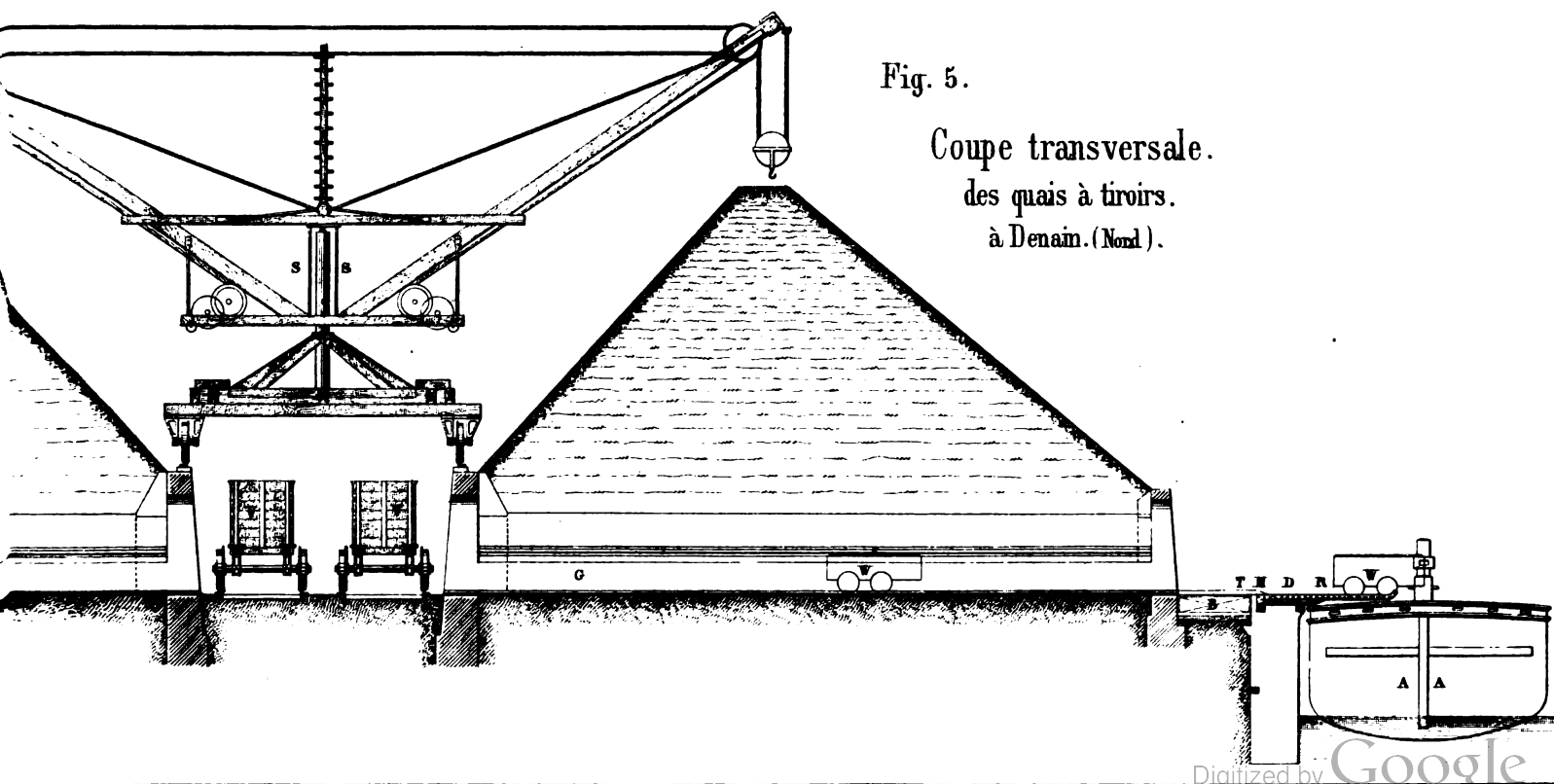
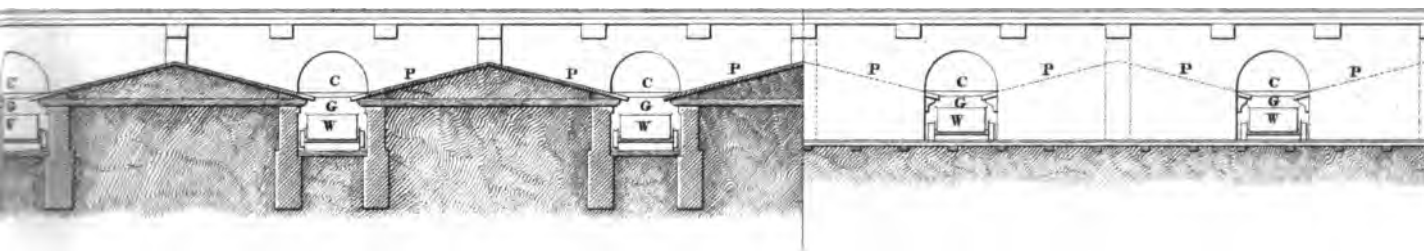
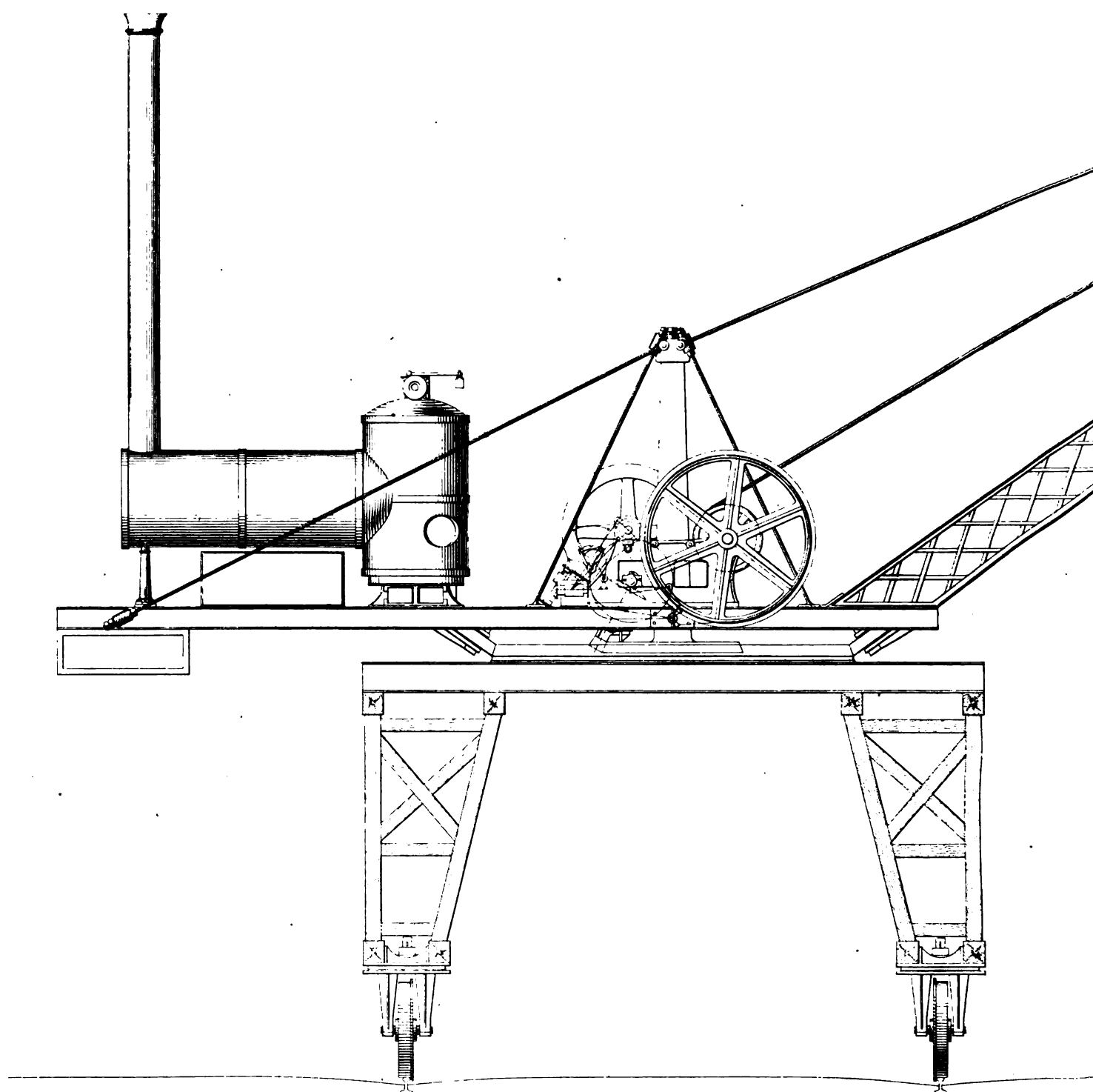


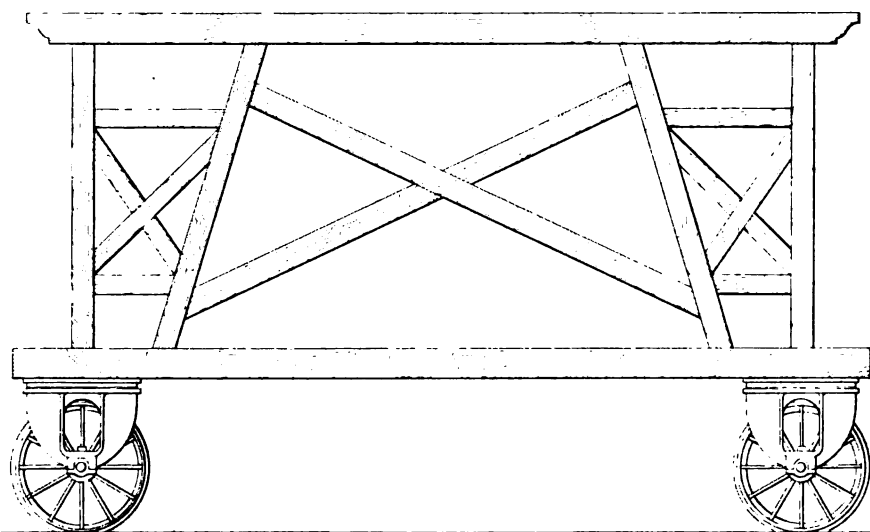
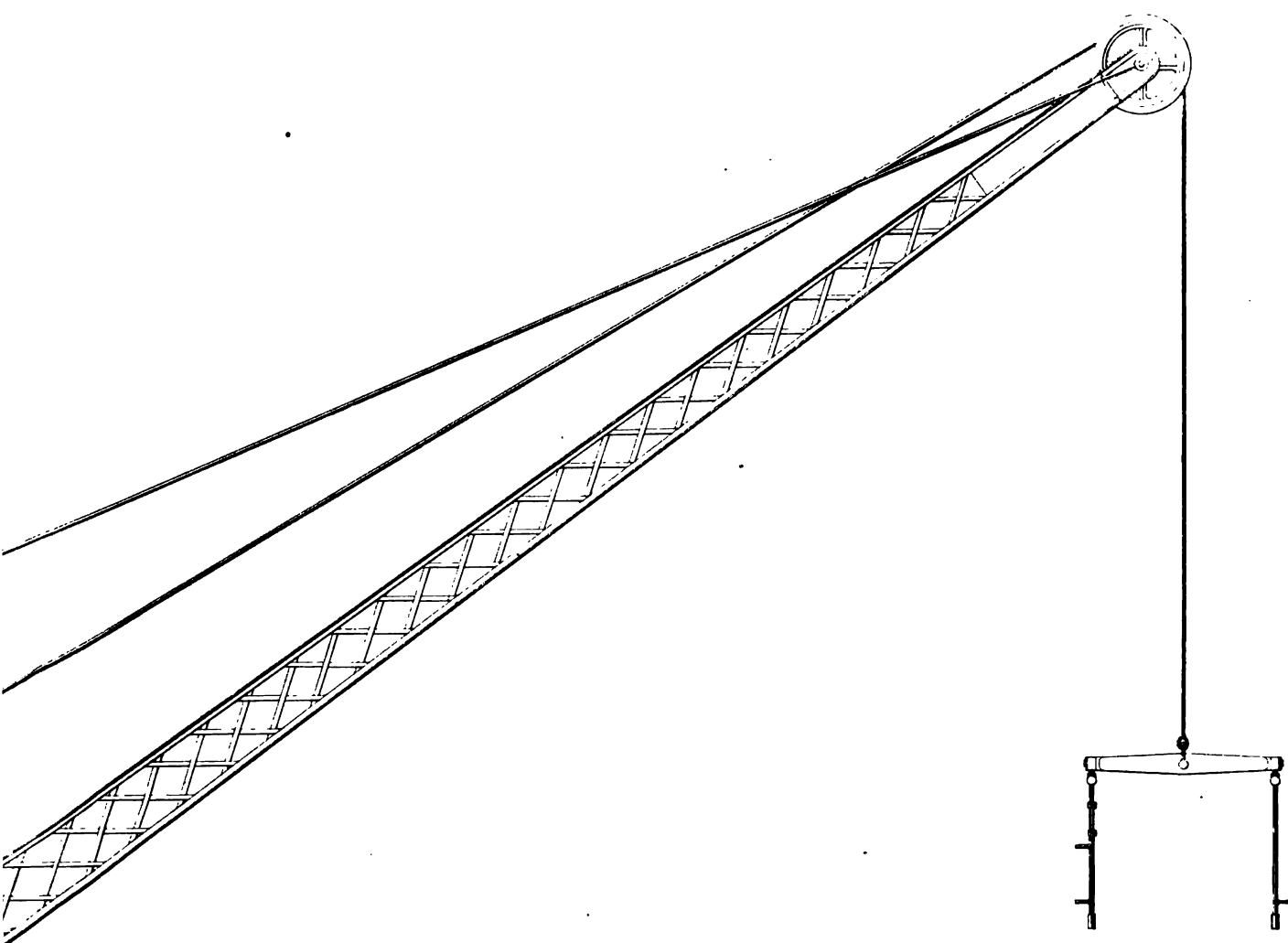
Fig. 5.

Coupe transversale.
des quais à tiroirs.
à Denain. (Nord).

GRUE QUILLACQ
POUR LE CHARGEMENT ET LA MISE EN TAS DES CHARBONS
A ANZIN.

Echelle $\frac{1}{50}$.





MONTE-CHARGES HYDRAUL.

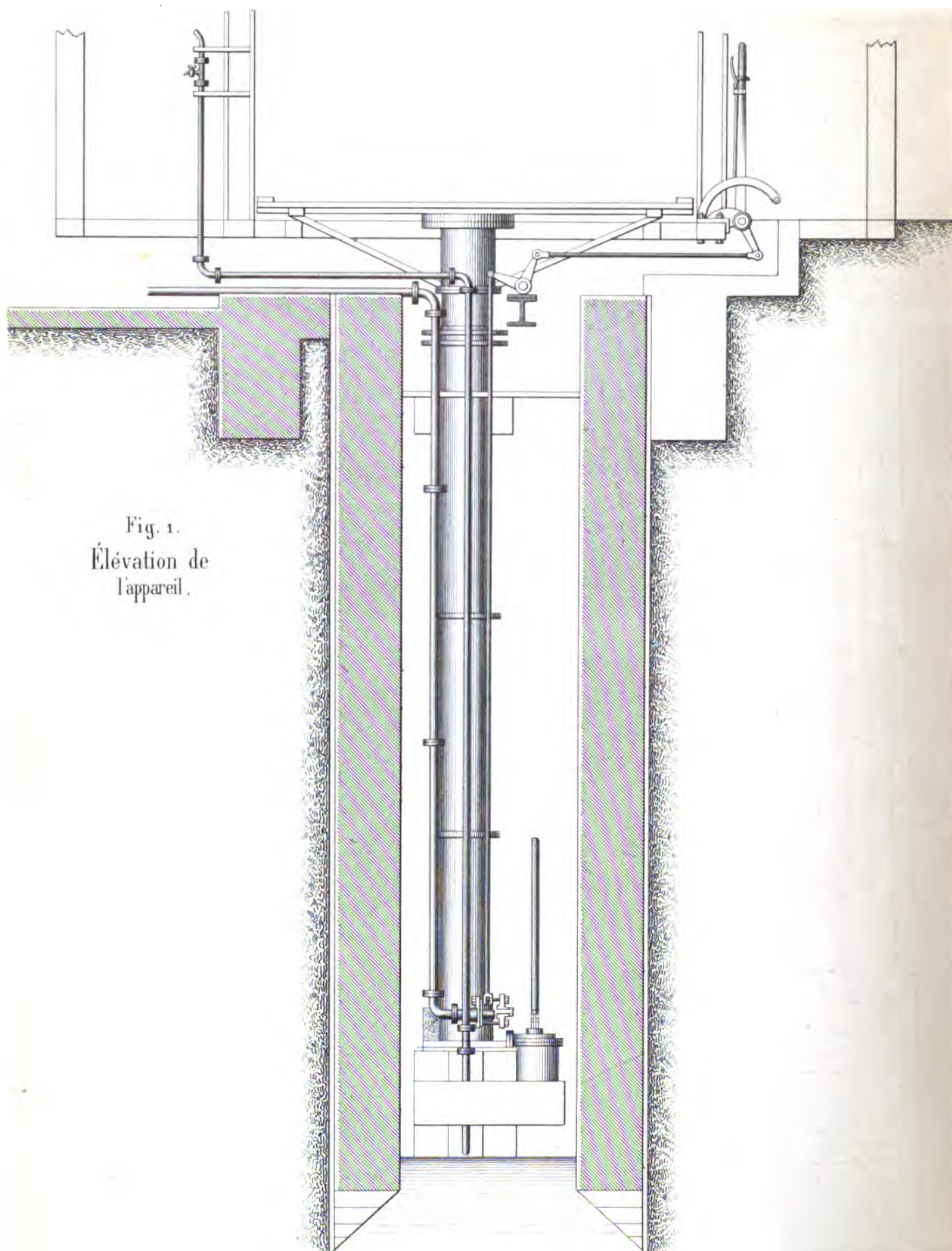


Fig. 1.
Élévation de
l'appareil.

Fig. 2.
Coupe
transversale

QUE DE CONCORDIA. (RUHR.)

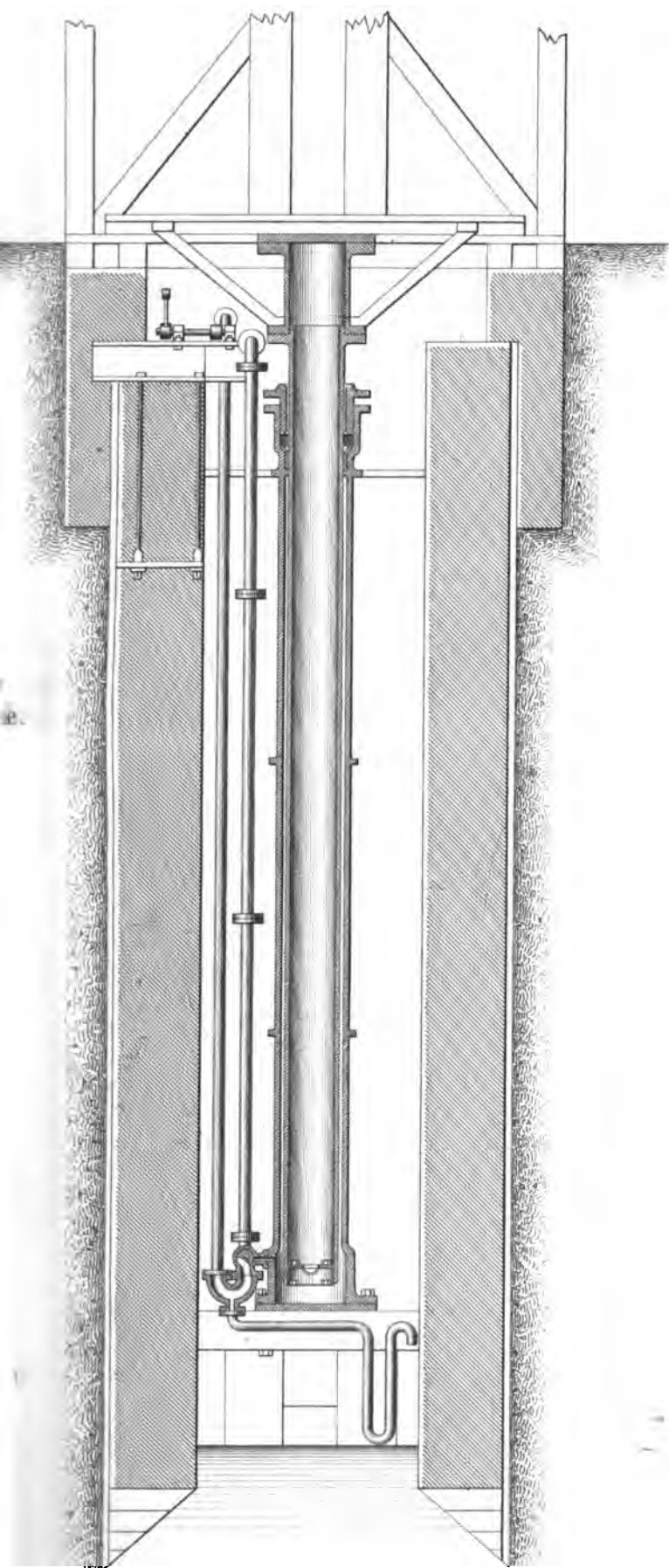
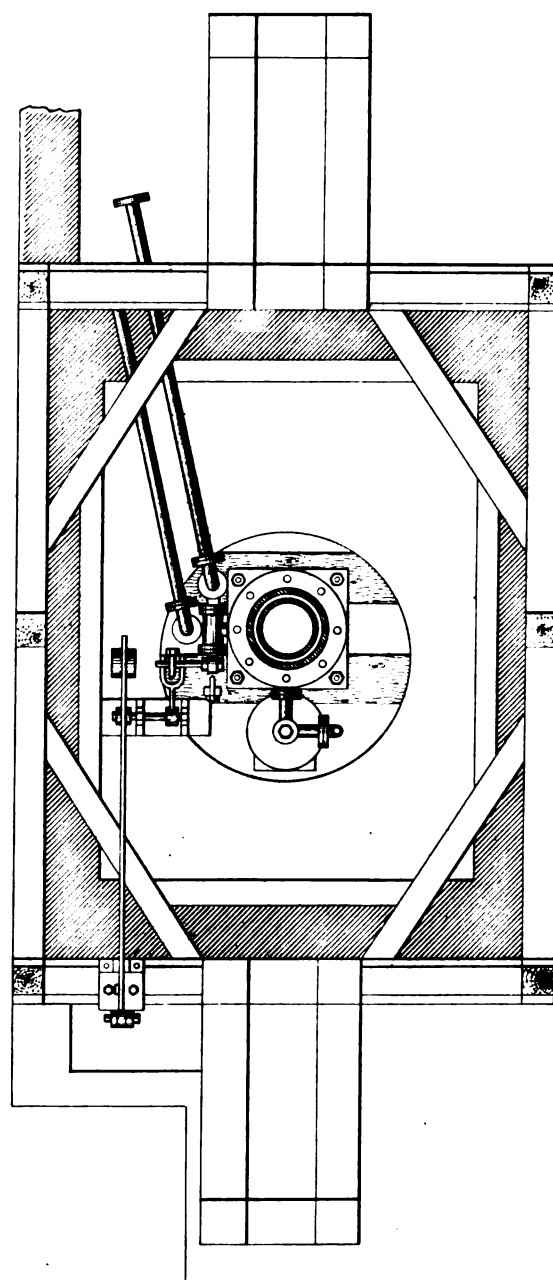
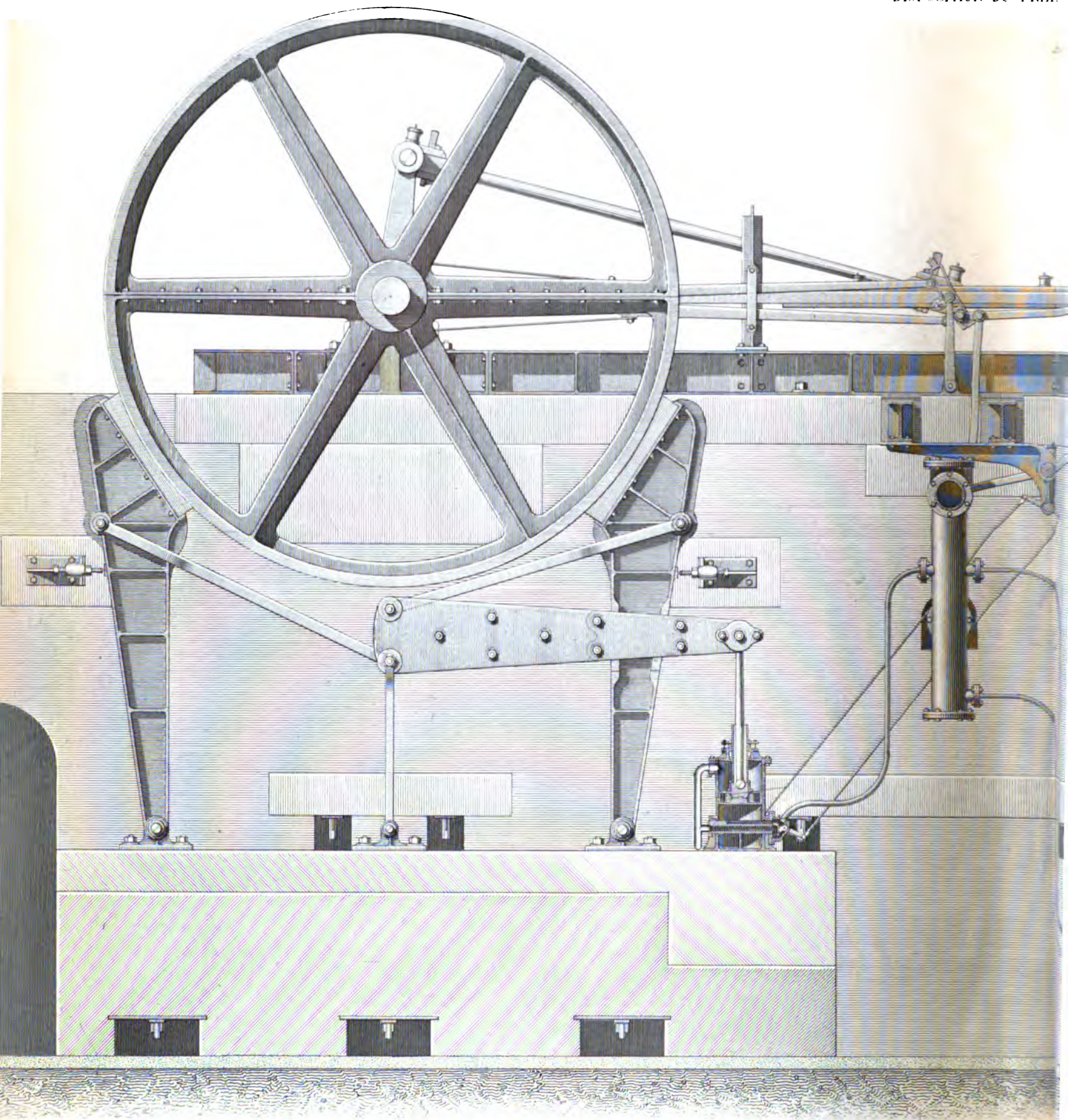


Fig. 3. Plan.

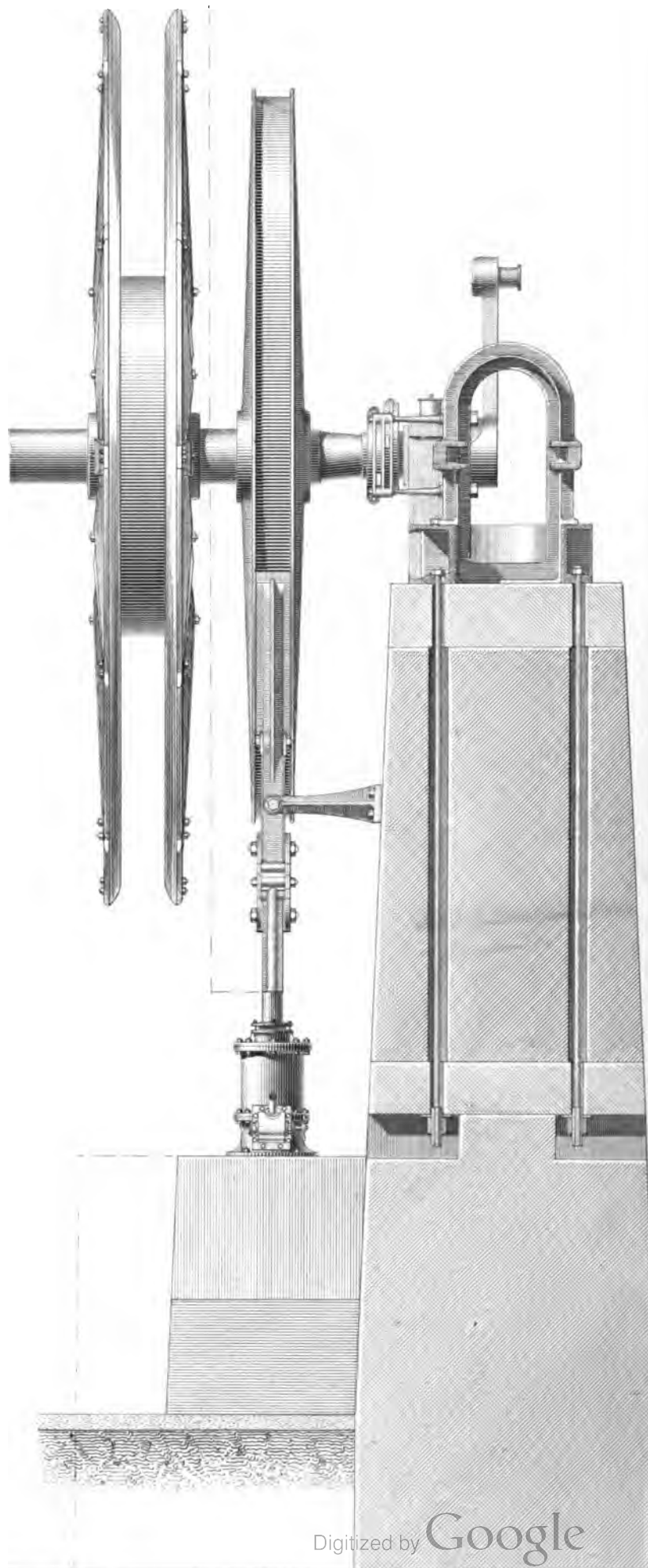
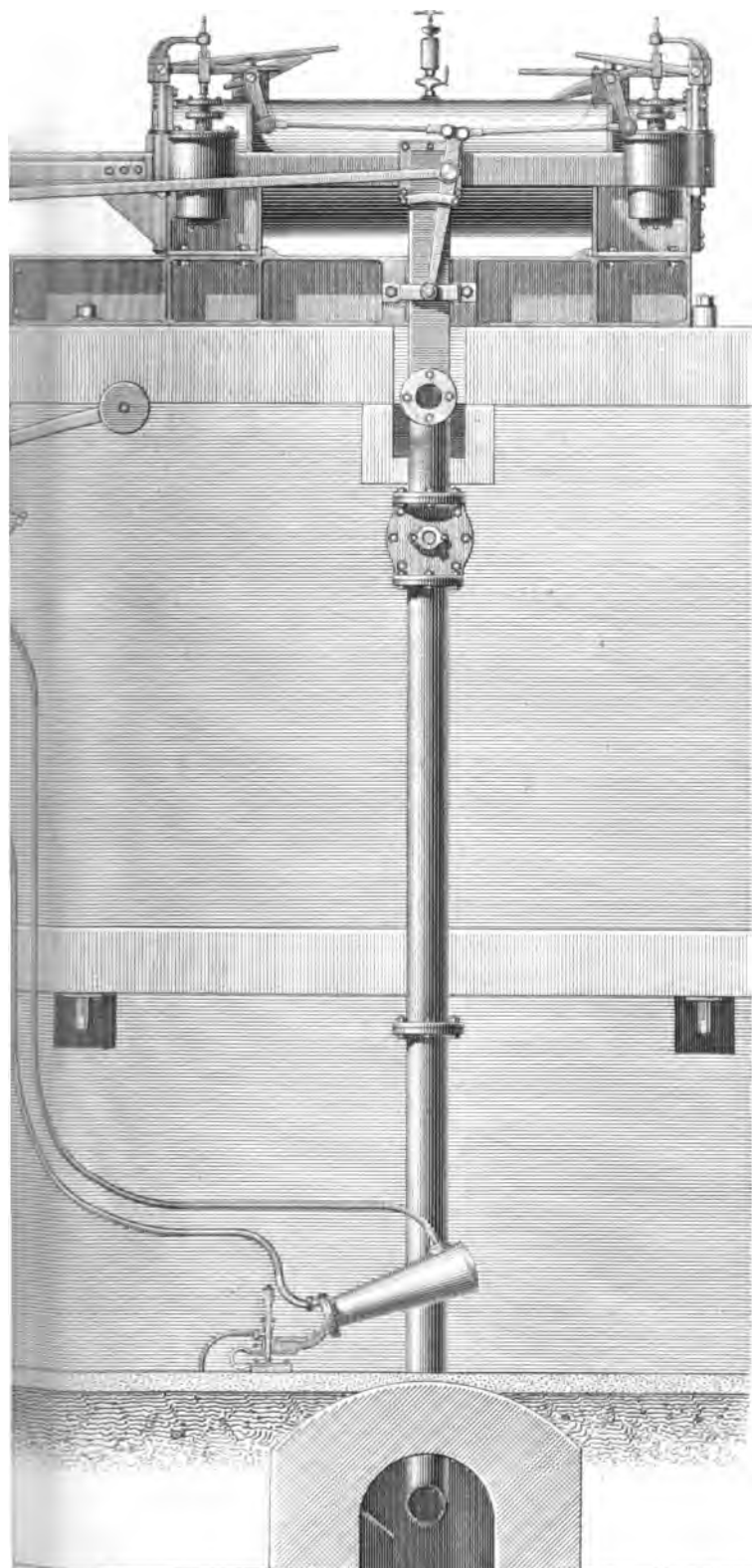


MACHINE D'EXTRAC
DISPOSITION DU FREI



EXTRACTION HORIZONTALE DU CREUZOT.
A VAPEUR A MONTCEAU LES MINES.

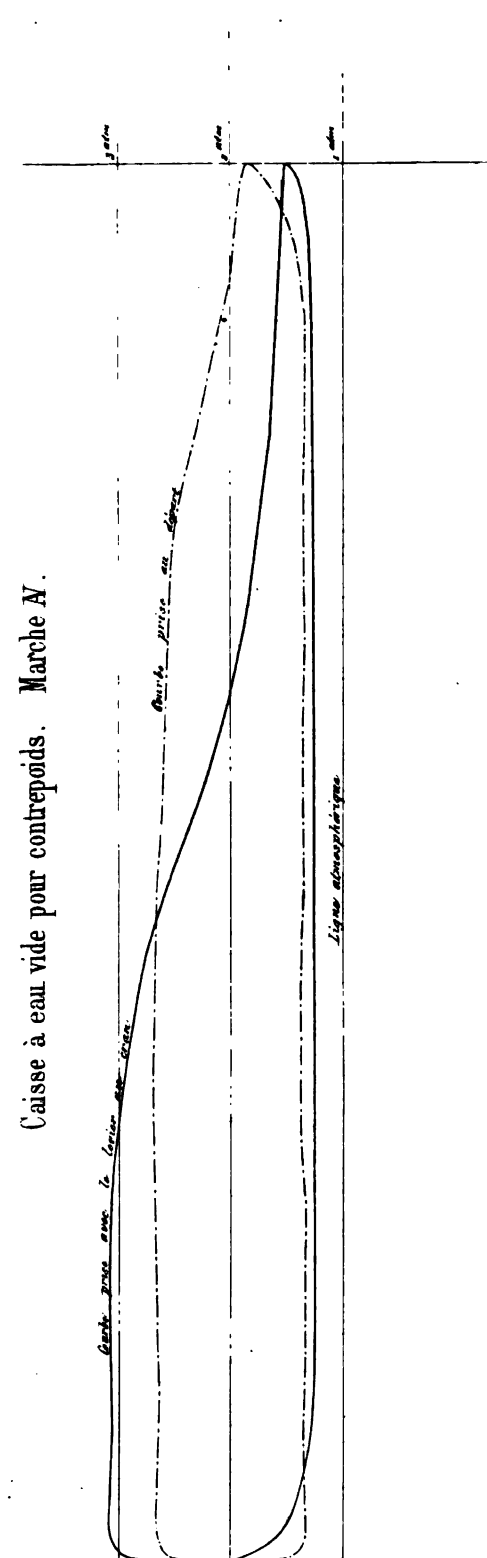
1 mètre pour mètre.



DIAGRAMMES DES MACHINES D'EXTRACTION A MONTCEAU-LES-MINES.

N°1. Extraction du charbon. Levier au cran. Pression $4\frac{1}{2}$. Détente $\frac{1}{2}$.

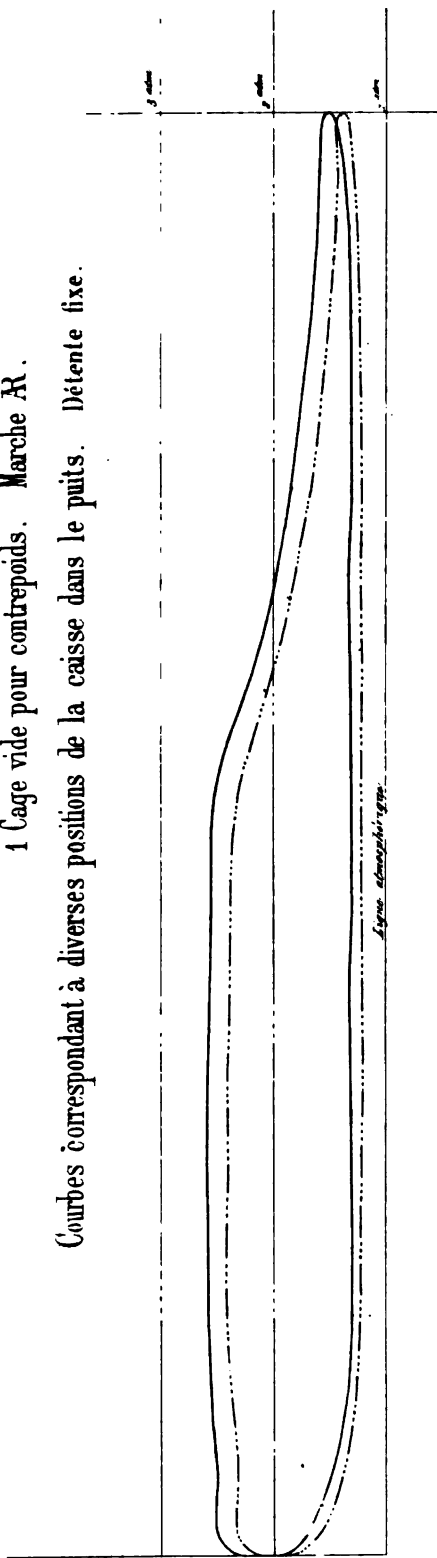
Caisse à eau vide pour contrepoids. Marche A.



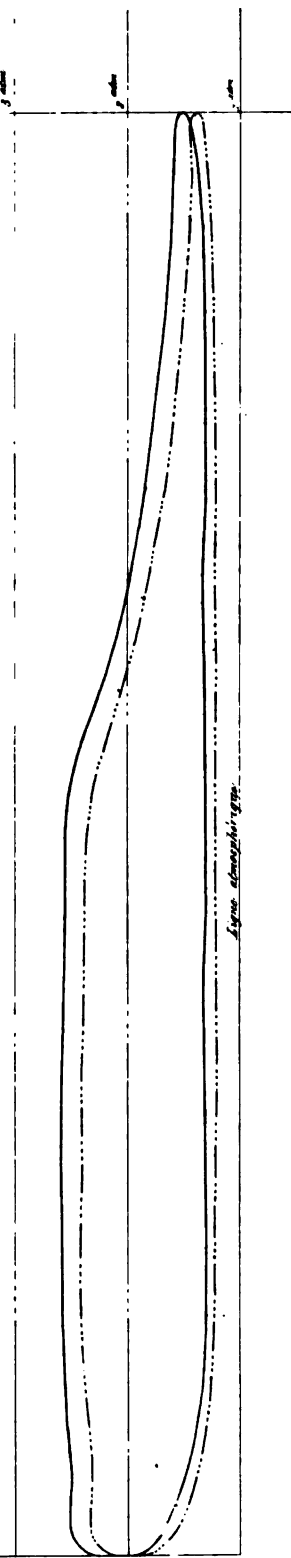
N°2. Épuisement. 1 Caisse à eau pleine monte

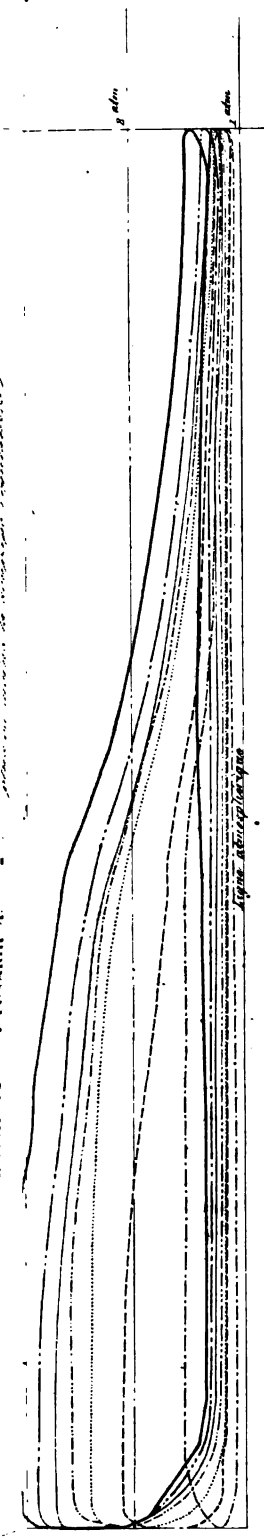
1 Cage vide pour contrepoids. Marche R.

Courbes correspondant à diverses positions de la caisse dans le puits. Détente fixe.

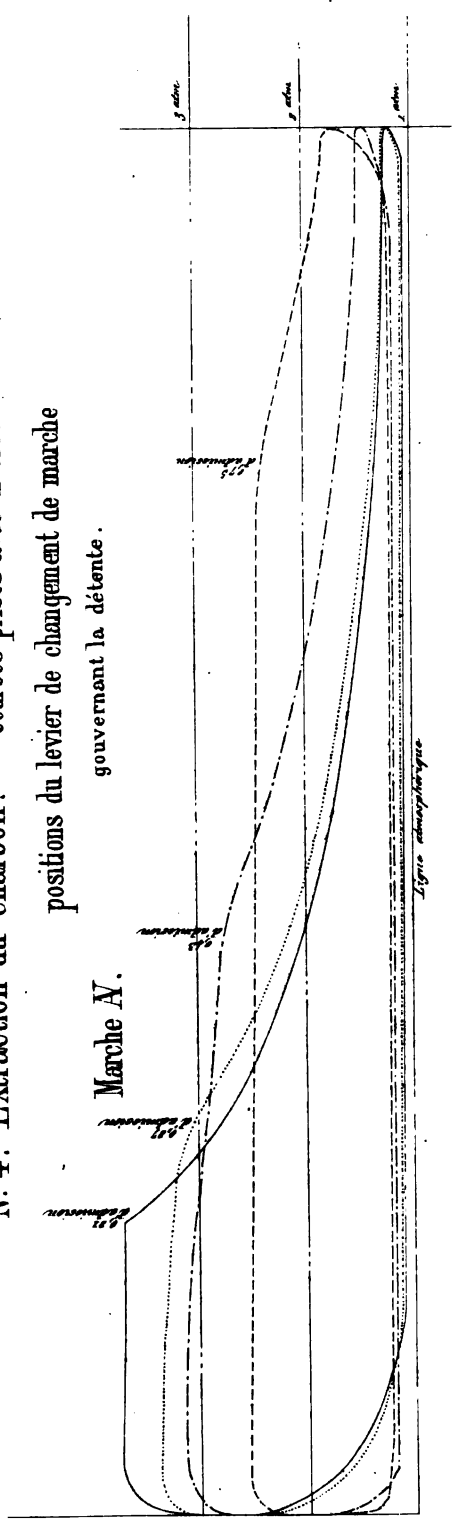


N°3. Extraction du charbon. Levier au cran manœuvre complète.

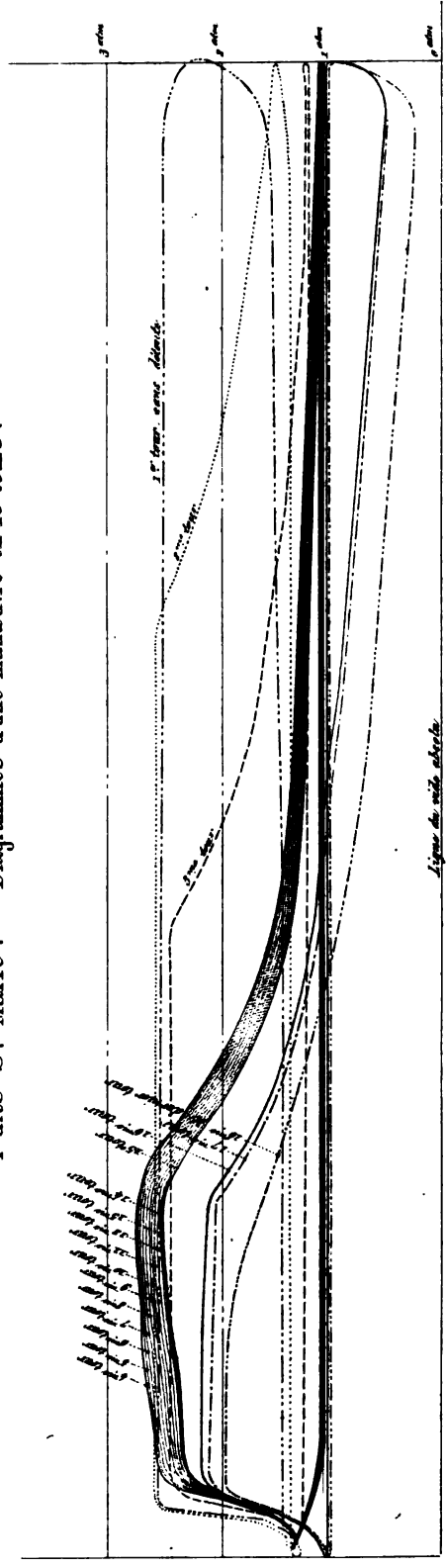
Marche A. Pression $4\frac{1}{2}$. (Manœuvre faite au volant plus ou moins le sursape régulatrice).



N° 4. Extraction du charbon. Courbes prises avec diverses positions du levier de changement de marche gouvernant la détente.



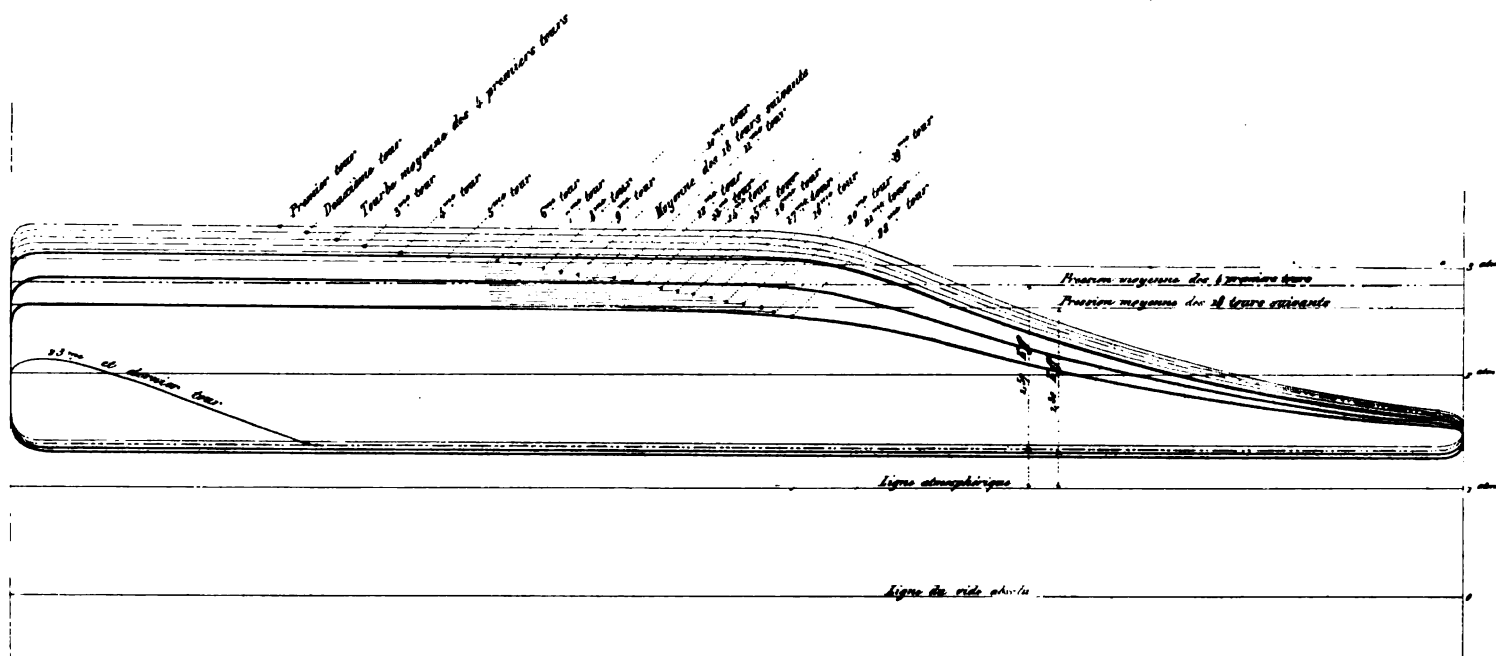
Puits S^{te} Marie. Diagrammes d'une manœuvre en 18 tours.



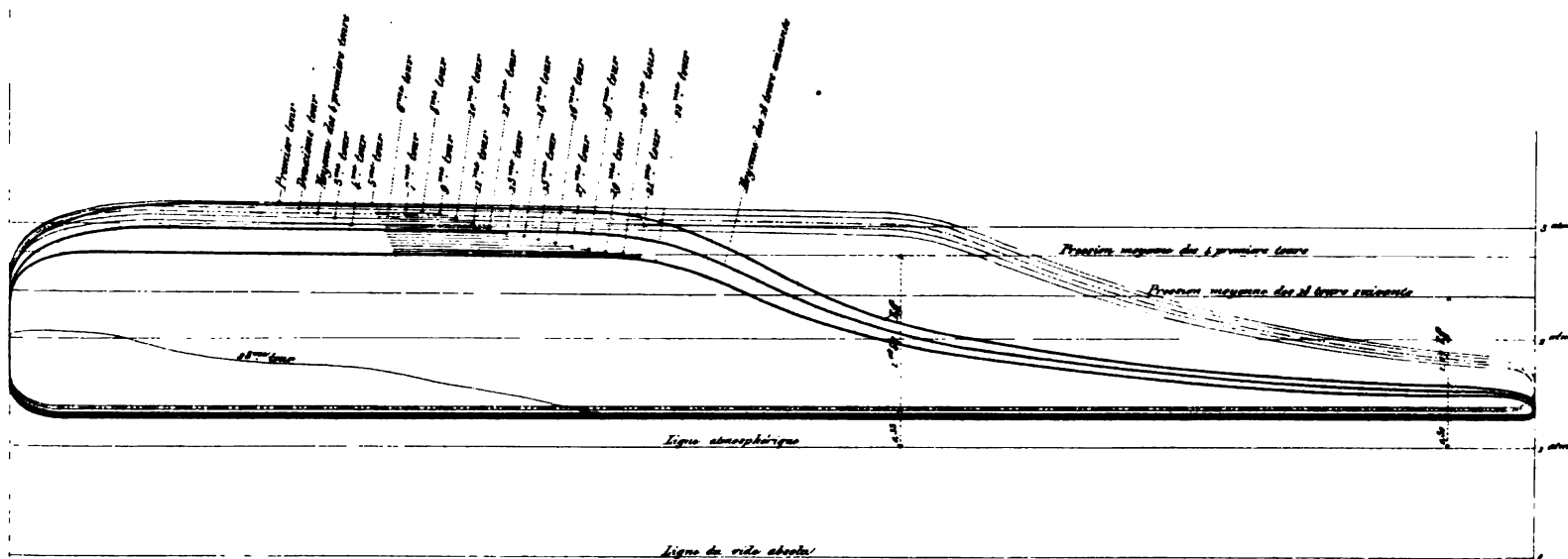
MACHINE D'EXTRACTION ST PIERRE.
(MACHINE A DEUX CYLINDRES. DIAMÈTRE 550^{mm}. COURSE 2.000.)

Diagrammes.

Marche à l'arrière.



Marche à l'avant.



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